JANUARY 30, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

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JAN 31 1956

Water for Survival

Industry learns to use it over before it uses it up . . . page 84

✔ WHAT NEW FREIGHT RATES CAN MEAN —page 39

✔ TO AUTOMATE OR NOT TO AUTOMATE? —page 42

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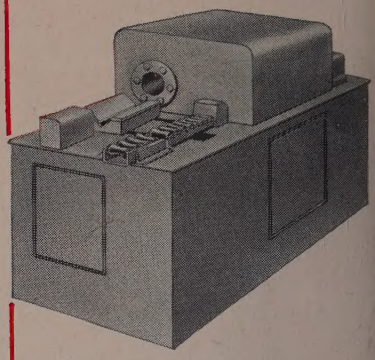
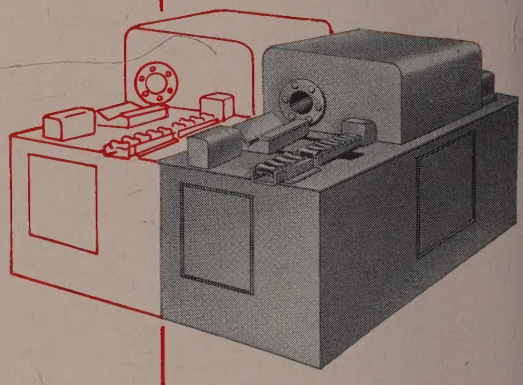
Magnethermic brass billet heaters



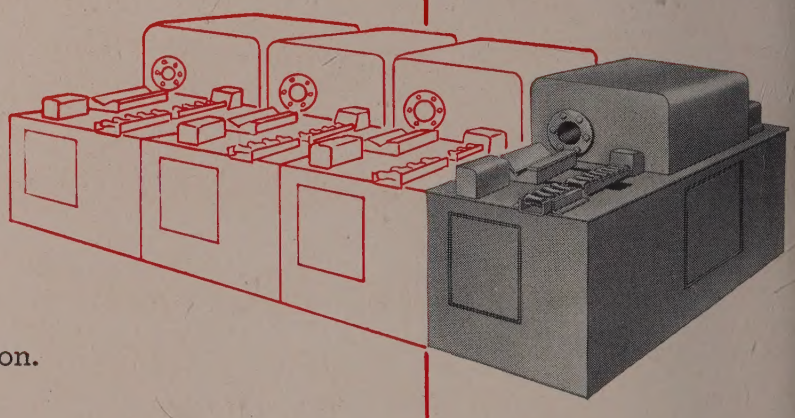
STANDARD UNITS

Available in 300 and 500 K. W. Single coil designs.



ANY COMBINATION

Two or more can be installed together for increased capacity.



AS PRODUCTION WARRANTS

Additional units may be added without disrupting the original installation.

"INDUCTION HEATING"

MAGNETHERMIC®

corporation

3990 SIMON ROAD · YOUNGSTOWN 7, OHIO

60 THROUGH 10,000 CYCLES

300 K. W. **500 K. W.**

Standardized units designed by Magnethermic. Provide a flexible low-cost method of installing induction heaters on your brass or copper extrusion press. Available in two sizes, 300 and 500 K. W. Multiples of these units may be grouped up to obtain any desired capacity. Install one now, add one later.

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corp. *Export Distributor:* Bethlehem Steel Export Corp.

Want Fast Tool Steel Service?

SEE YOUR BETHLEHEM DISTRIBUTOR

Whether you want to order a quantity of tool steel, or merely a short bar, or just would like a bit of advice about the correct method of heat-treatment, you're sure to find your Bethlehem tool steel distributor anxious to be of service.

Prompt service is your distributor's middle name. He makes it a point to know your city like a book—its background, its people, its industry. He knows what grades of steel you are most likely to need, and in what quantities. And so he keeps large stocks of Bethlehem tool steel on hand, in a virtually endless variety of types, all of them ready to go at a moment's notice.

If you would like bars cut to special length, or if there's a tricky phase of metallurgy or some other tool-steel problem troubling you—again, your distributor is at your beck and call. He's a real friend. They don't come any better. It will pay you to get to know him.

BETHLEHEM STEEL

3 WAYS to get greater precision a

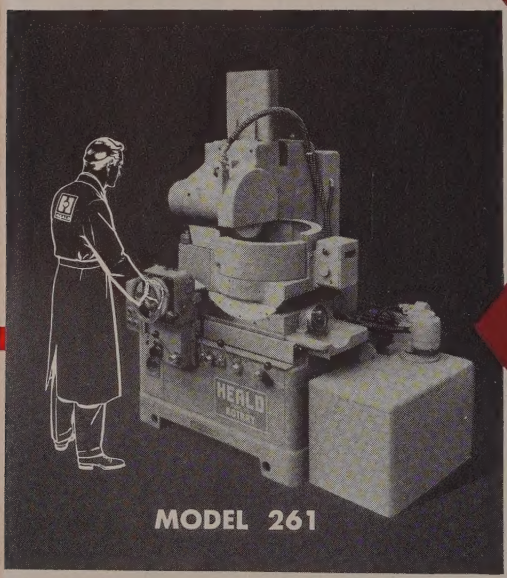
HIGHER EFFICIENCY

in rotary surface grinding..

new MODEL 161

SMALL SIZE WORK

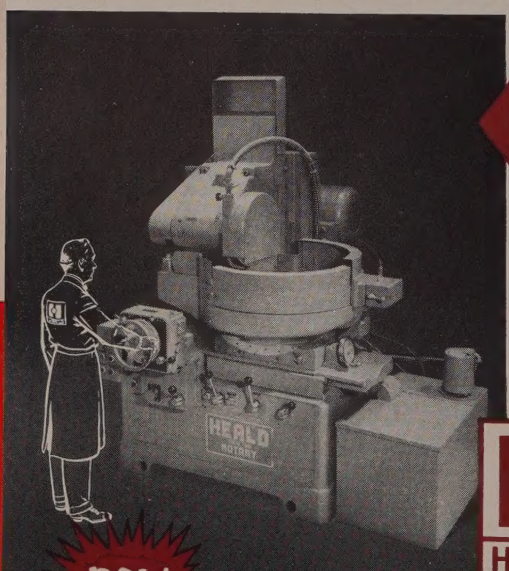
This compact, low-cost machine with 6″ magnetic chuck gri flat, concave or convex surfaces to extremely low microinch fini Features include rigid, column type construction, manual or po reciprocation, simple mechanical reversal, "right-hand" operati and powerful direct-drive wheelhead. For complete informati send for Bulletin 1-161.



MODEL 261

MEDIUM SIZE WORK

Available with 12″ or 16″ rotating chuck, this heavy-duty mach does high precision surface grinding on a wide range of small medium-size work. Smooth, hydraulic operation of wheelslide a table reciprocation can be arranged for manual or fully autom control. Vertical column construction places wheel pressure dire over table ways for maximum rigidity of support. Grinds f convex or concave surfaces. Bulletin 1-261 gives complete deta



new MODEL 361

LARGE SIZE WORK

A massive, heavy-duty machine with 24″ rotating chuck for pr sion grinding of flat, convex or concave surfaces on large, he work. Available with either manual or fully automatic cont Heavy, rugged base and column construction, with smooth, i nitely variable hydraulic feeds, assures freedom from chatter a vibration. Hydraulic power unit with multiple pump system p vides separate lubrication pressure and operating pressure. further details, send for Bulletin 2-361-S.

Three more reasons why IT PAYS TO COME TO HEALD.

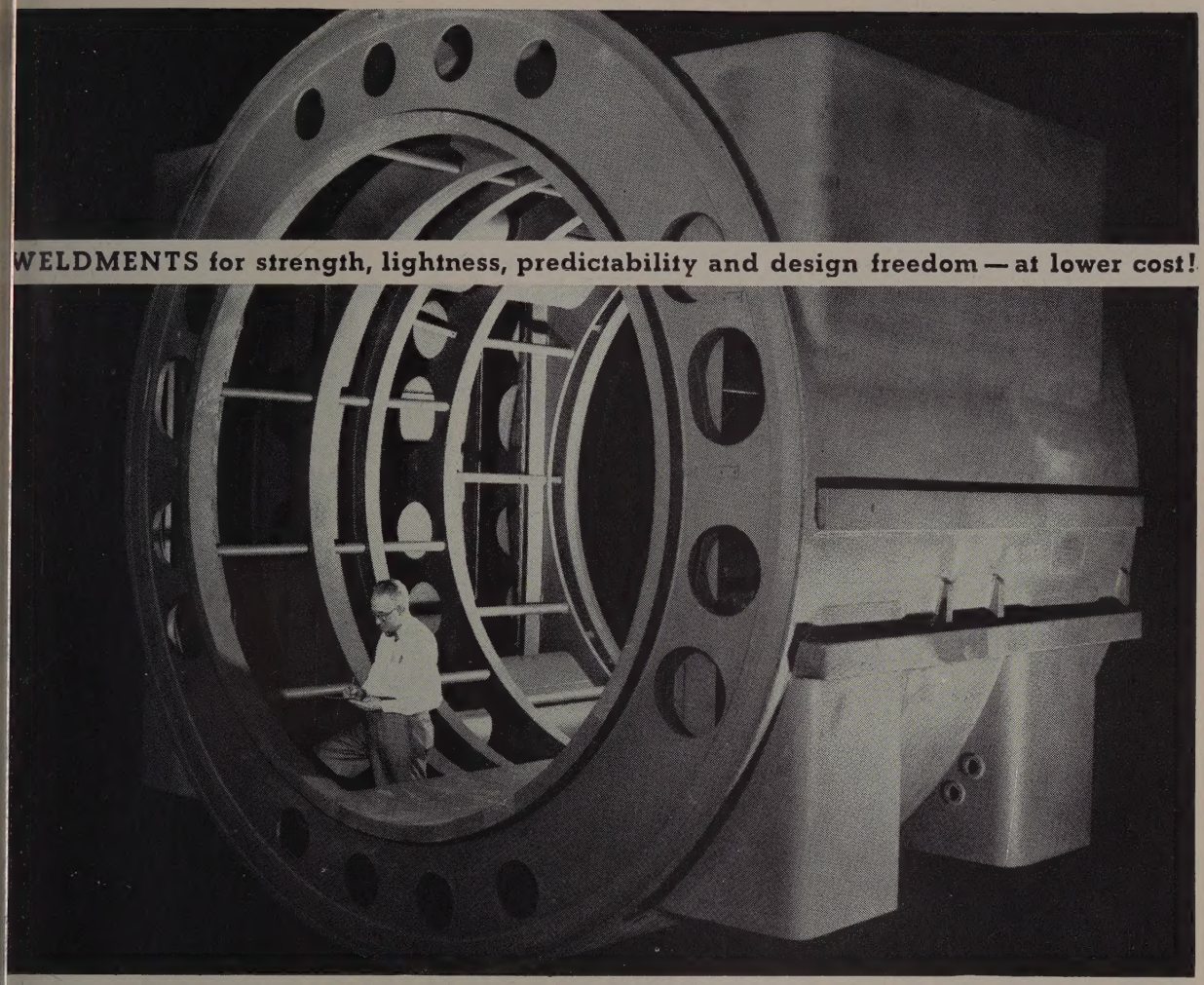
HEALD®

THE **HEALD** MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New


WELDMENTS for strength, lightness, predictability and design freedom — at lower cost!

ELECTRICAL GENERATOR FRAME: End section of a three-piece stator frame built by Lukenweld for General Electric. This type of welded structure provides remarkable rigidity and strength at critical points with a minimum of weight.

LUKENWELD QUALITY WELDMENTS OFFER YOU A UNIQUE COMBINATION OF ADVANTAGES

Lukenweld welcomes orders for the really big and challenging weldments. The most extensive facilities and longest experience of any commercial weldery in the country combine to save you money and time. Here's how...

DEPENDABILITY The predictability and rigidity of welded structures plus Lukenweld's specialized knowledge of design and materials selection assures equipment that will perform efficiently, longer.

RELIABLE SOURCE OF MATERIALS Carbon, alloy and clad steel plates in the widest range of types and sizes available anywhere are obtainable "right next door"—from the Lukens rolling mills.

CONSULTATION SERVICE Metallurgical, design engineering, related services are available on your job.

FINISHING FACILITIES Modern heat treating, machining and other finishing facilities are your assurance of complete quality control from steel plate to finished weldment—ready for assembly in your equipment.

EXPERIENCE Lukenweld, the first commercial weldery in the U.S., pioneered many advances in welded construction. Knowledge and craftsmanship gained through this experience make Lukenweld unusually qualified to meet your weldment needs.

FOR INFORMATION on how Lukenweld can answer your particular weldment problems or for a copy of the informative booklet, "Weldments by Lukenweld," write on your company letterhead to Manager, Marketing Service, 819 Lukens Building, Coatesville, Pa.

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A DIVISION OF LUKENS STEEL COMPANY
COATESVILLE, PENNSYLVANIA

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of
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ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

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ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE

STEEL
The Metalworking Weekly

JANUARY 30, 1956
Vol. 139 No. 5

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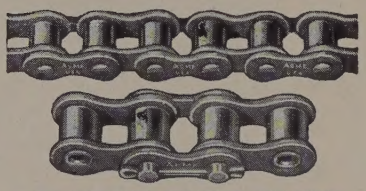
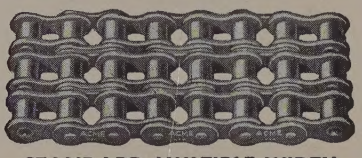
WRITE FOR THIS
FREE
TEXT
Acme Chain
An accurate and useful 76 page compilation of chain data. A valuable textbook for engineers . . . grows to be indispensable. Free upon request to Dept. 10-X, ACME CHAIN CORP., Holyoke, Mass.

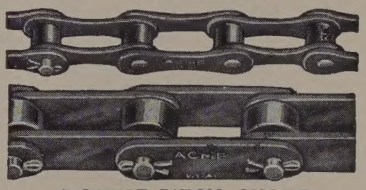
COMPLETE PRODUCTION FACILITIES AND PROMPT DELIVERY ON ALL THESE CHAINS



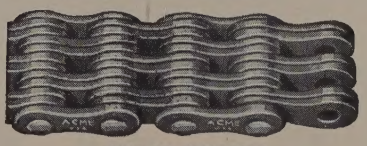
STANDARD ROLLER CHAINS
Available in pitches from 3/8" to 2½" riveted and detachable type.



STANDARD MULTIPLE WIDTH
Multiple widths of six strand or wider available for special application.



DOUBLE PITCH CHAIN
For use in slower speed power transmission and material handling conveyors.



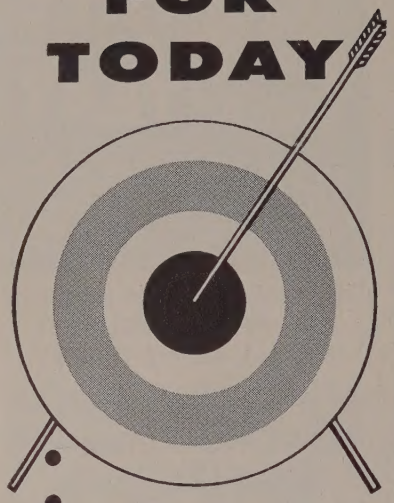
CABLE CHAINS
Acme Cable Chains are furnished in a variety of pitches, widths and strength.

SPROCKETS
Acme Sprockets are available in a wide range of sizes, in all types.

PHONE JEfferson 2-9458.

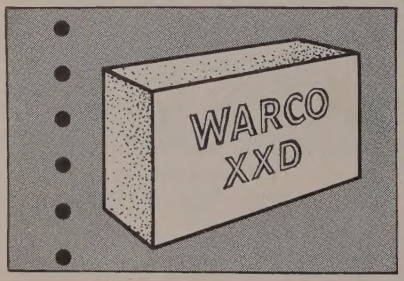
Acme Chain Corporation
HOLYOKE MASSACHUSETTS

TARGET FOR TODAY



Today, the choice of the right refractory is more important than ever before. That means choosing a refractory with a combination of physical characteristics such as Warco XXD. With lower porosity and higher bulk density, Warco XXD, High Duty Fire Brick, is noted for unusual resistance to thermal shock. Especially recommended for checker brick work in open hearths, hot blast stoves and for use in soaking pit coping tile, Warco XXD is the last word in physical properties that assure greater value per dollar invested.

Dry press process. In standard sizes and many special shapes. Write for details.



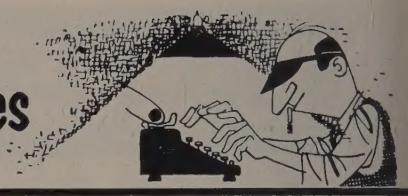
Specialists in Refractories of High Bulk Density and Low Porosity.

WALSH REFRACTORIES CORPORATION

101 FERRY ST. • ST. LOUIS 7, MO.

FOR OVER 60 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

behind the scenes



STEEL Takes Wing

Early in January, activities in STEEL's circulation department, Penton Publishing Co. Ltd., London, came to a startled standstill. Mrs. G. M. Woodford re-examined a letter from the Rodney Book Service, Rodney House, Monmouth St., London, W. C. 2., and might have been pardoned for muttering a mild request to be struck pink. The Rodney people declared they had a client who wanted to subscribe to the American magazine STEEL, and wanted it posted from the U. S. by air mail. Mrs. Woodford sensed that when this bit of information reached Circulation Manager Rand Ebersole in Cleveland, it would strike him all of a 'eap.

It did, too. Rand sharpened a handful of pencils and began figuring. A subscription posted to the tight little island by air would amount to $138.85. Since it was fairly obvious that nobody would pay that much money for a magazine subscription, Mr. Ebersole unlimbered his Dictaphone and breathed into it one of the greatest understatements of modern times. "This rate," he said, "should be rather discouraging."

Rodney's client wasn't the least discouraged; indeed, his interest must have been whetted, because he laid the money right on the line before the subscription was even approved. The subscription goes to a London technical research organization. We have a hunch that if these copies are to be routed, recipients may be requested to wear gloves. At about $2.60 each, ain't nobody going to mess up *these* magazines!

Chickens Out in Research

The eagerness of our young editors is a constant delight to management and stockholders, but occasionally even the most enthusiastic budding business scribe will side-step a nugget of pertinent information because: 1. He senses it won't pass the copy desk. 2. He fears he can't turn it to good account. 3. He imagines readers of STEEL will mistake his interest.

Assistant Editor Byron Kennel found himself in this predicament a few weeks ago. He was assigned to do a story on metal spinning (page 50), and whilst (that's the Rodney influence, no doubt) he was investigating his subject, he came upon an excellent brochure, "The Story of Metal Spinning," prepared by the Roland Teiner Co., Everett, Mass.

On the inside cover an imaginative commercial artist had depicted a solemn Egyptian artisan spinning a metal cup of astonishing proportions—considering that it was one of a pair being prepared for a lady who hovered nearby. A printed insert carried a confession by the Teiner people that the metallic uplift had stirred up a great controversy. To settle the matter, they had prepared an additional mailing piece, which was free for the asking.

Did Byron write for this addendum on archaeological bronze brassieres? He did not. "My subject," he whispered, "was metal spinning, and I'm sure none of our readers would have been interested in—ah—in things like that." He thought for a moment, and added: "You know, if Cleopatra had been wearing something like that, it would have been rough on the asp, wouldn't it?"

The Sporting Gourmet

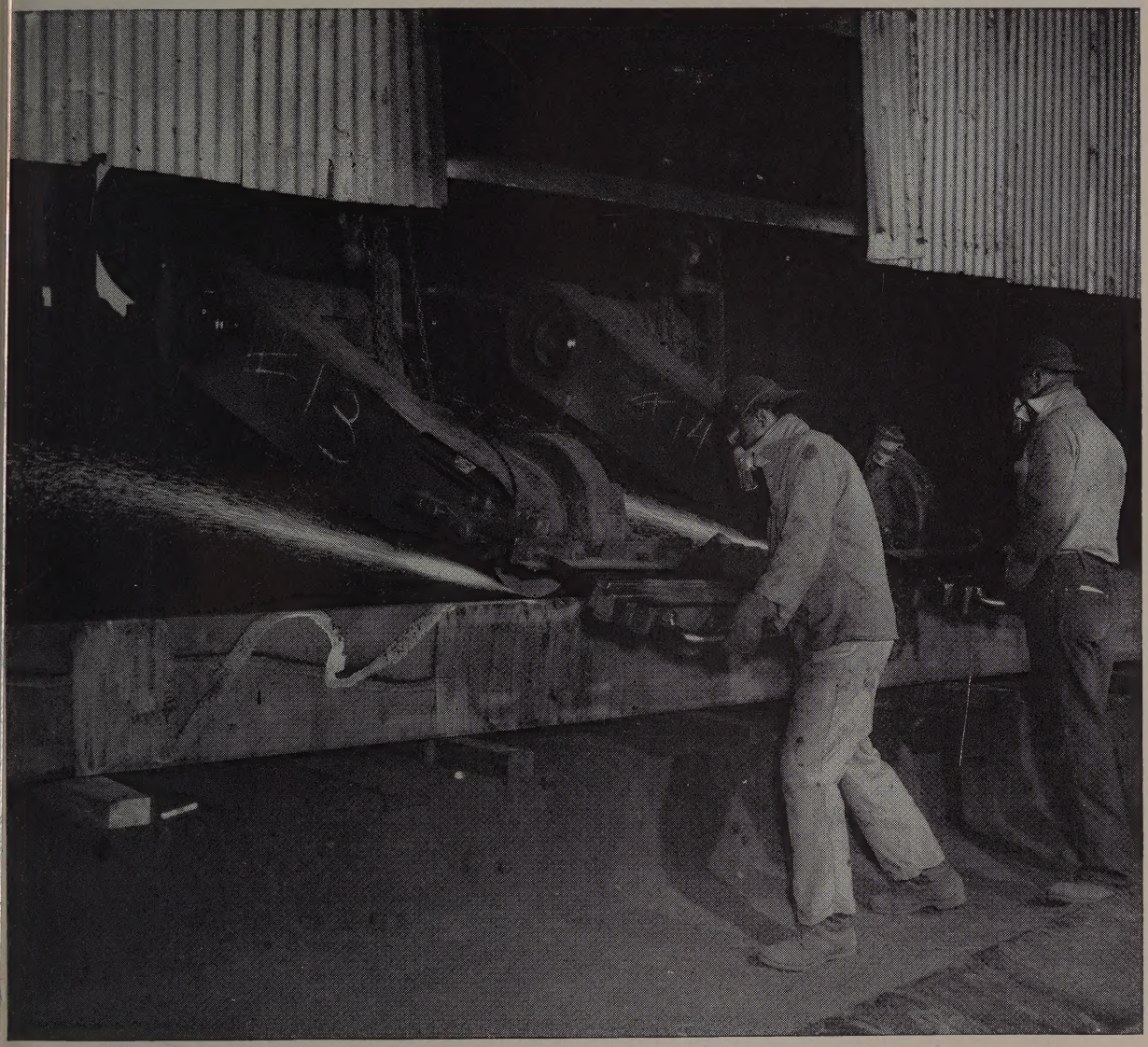
The answer to ROAST MULES was SOMERSAULT, and we received many interesting comments concerning it. Here is one that is as simple as it is silly. In upper Mbjrombha, a small village in central Zanzibar, Chief R. J. Hmkghlo was preparing a 151-lb medical missionary for supper, when his gambling instincts got the better of him. Seizing the drumstick of his victim's predecessor, the chief beat time to a propositional chant:

Doctah, Doctah, look alive!
Eight ain't eight: a eight is five;
Five is three, and three is two,
And here is what you gwiner do:
Take the sum of fo' times eight
And add it to yo' present weight;
Divide it, Doc, by five and see
What's left when you subtract a three—
And if you get the answer right,
Ah will not eat you, Doc, tonight!

Shrdlu

(Metalworking Outlook—Page 33)

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



They give steel a hot rubdown

A typical example of B. F. Goodrich improvement in rubber

THOSE sparks come from grinding wheels that cut through the hard, rough, scaly coating that's on stainless steel when it's first made.

V belts, running at high speed, keep the wheels spinning. But just imagine the jolt to belts when the abrasive wheel bites into steel.

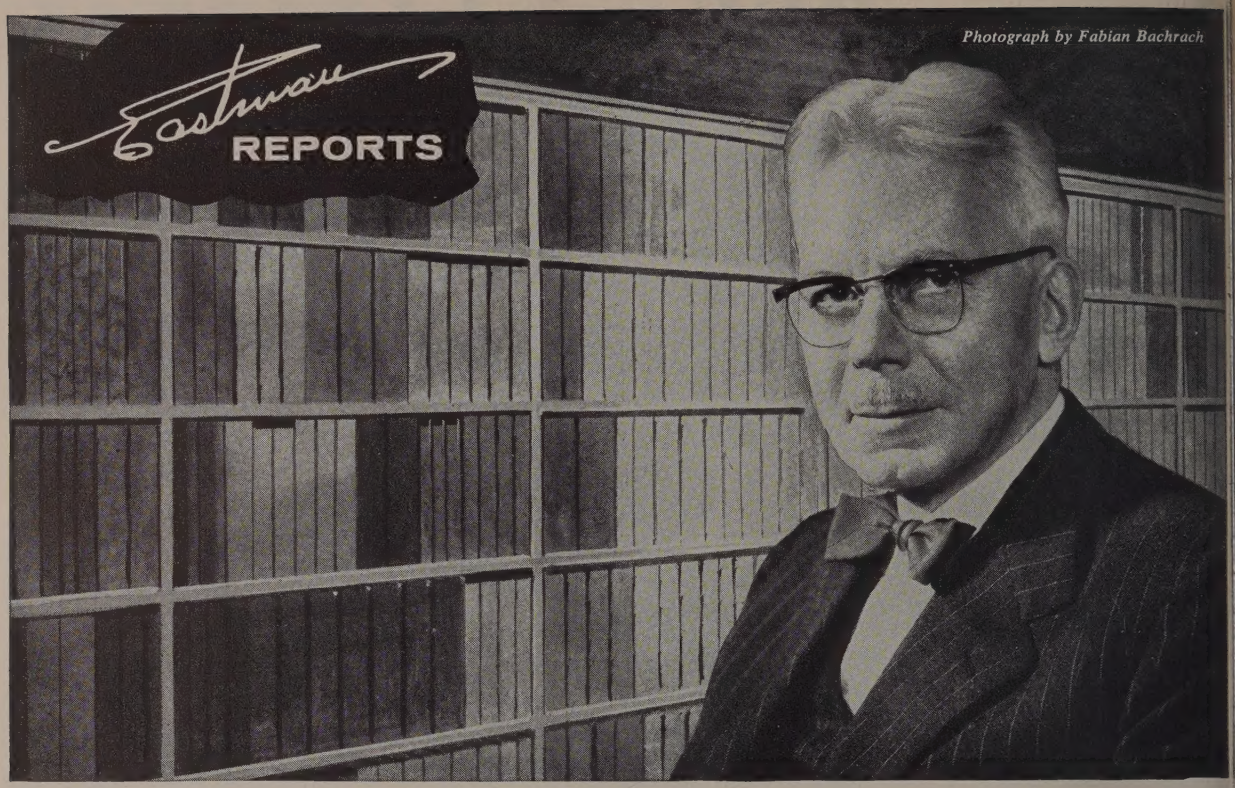
Different kinds of V belts were tried. None lasted more than a few weeks. Some weren't strong enough to take the high speed and jerks. Some weren't flexible enough to take the constant bending over small pulleys.

Then a distributor told the steel company about Grommet belts developed by B. F. Goodrich engineers. The grommets are two extra strong cord loops inside the belts, like twisted cables except that they're endless. High-capacity Grommet belts were put on the grinders. They're so much stronger they last *5 to 6 times longer* than previous belts.

Today's B. F. Goodrich V belts are the result of constant improvement, better processes for prestretching cords, for improving cord adhesion, for reducing internal heat and friction. In these and many other ways B. F. Goodrich belt engineers have successfully attacked the common causes of V belt failure, and in many cases, more than doubled belt service life.

That's why you can be sure of top performance and real money savings when you buy B. F. Goodrich V belts or any rubber product from your B. F. Goodrich distributor. *The B. F. Goodrich Company, Dept. M-546, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION



Eastman's confidential Editorial Research Reports to publishers prove that readers find advertising in Business Publications as interesting as editorial material. The full Eastman release on this subject is available to you on request.

"70% of Advertisement Reading in Business Publications is intentional—not accidental"

says **ROY EASTMAN** of the Eastman Research Organization

"Why shouldn't it be," Mr. Eastman continues, "since Business Publications advertise the very things by which readers make their livings?"

"A year and a half ago, we injected into all of our confidential readership surveys a penetrating inquiry as to *how* the advertising was read.

"The overall results of a year's inquiry on this subject (32 surveys for 18 publications) show that the average exposure to advertising is *70% intentional,* only 30% accidental.

"Moreover, 94% of the readers of these publications, on the average, reported that they gave conscious attention to the advertising."

Advertisements in Business Publications reach an audience that's interested in your message . . . an audience that wants to read what you have to say.

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The national association of publishers of 173 technical, professional, scientific, industrial, merchandising and marketing magazines, having a combined circulation of 4,098,937 . . . audited by either the Audit Bureau of Circulations or Business Publications Audit of Circulation, Inc. . . . serving and promoting the Business Press of America . . . bringing thousands of pages of specialized know-how and advertising to the men who make decisions in the businesses, industries, sciences and professions...pin-pointing the market of your choice.

Write for a list of the NPB publications and the "Here's How" booklet, "How Well Will We Have to Sell Tomorrow?", written by Ralston B. Reid, Advertising & Sales Promotion Manager of the Apparatus Sales Division, General Electric Company.

Let's Talk About Productive Maintenance

The ideal basis for any productive maintenance program is Remington Rand Kardex. Remington Rand Kardex combines in a single, accessible record complete information about each machine — characteristics, frequency of repairs, maintenance service and costs. Colored Kardlok signals let you review your entire program in a matter of moments, providing quick, effective, "locked-in" control.

In addition, Kardex is the ideal record for spare parts inventory control. An effective stores control system is indispensable to preventive maintenance. Without proper inventory control of replacement parts, valuable production will be lost and machine down time greatly increased.

Both these applications of Kardex are discussed in FREE booklet X1383, "Assured Equipment Productivity Through Maintenance Management." Write for *your* copy today. Address Room 1172, 315 Fourth Ave., New York 10, N. Y.

Remington Rand
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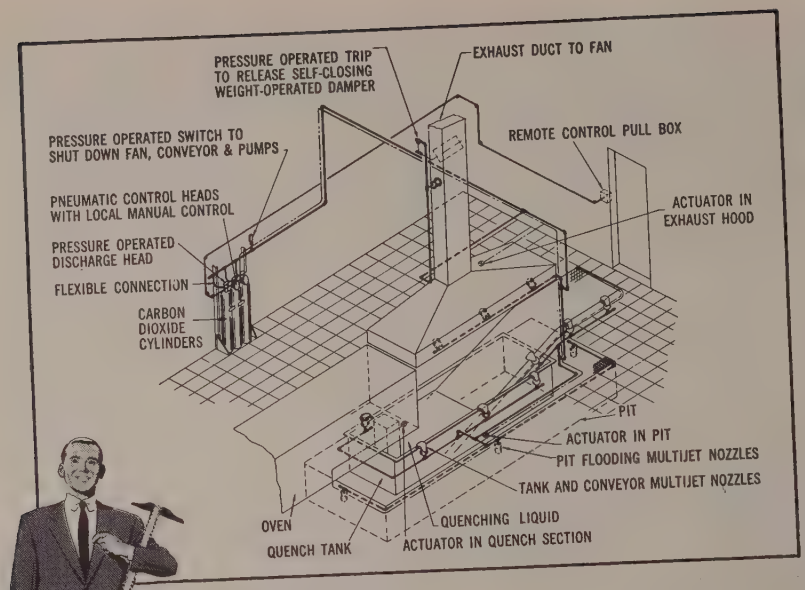
PRESSURE OPERATED TRIP TO RELEASE SELF-CLOSING WEIGHT-OPERATED DAMPER
EXHAUST DUCT TO FAN
PRESSURE OPERATED SWITCH TO SHUT DOWN FAN, CONVEYOR & PUMPS
REMOTE CONTROL PULL BOX
PNEUMATIC CONTROL HEADS WITH LOCAL MANUAL CONTROL
ACTUATOR IN EXHAUST HOOD
PRESSURE OPERATED DISCHARGE HEAD
FLEXIBLE CONNECTION
CARBON DIOXIDE CYLINDERS
PIT
ACTUATOR IN PIT
PIT FLOODING MULTIJET NOZZLES
TANK AND CONVEYOR MULTIJET NOZZLES
OVEN
QUENCH TANK
QUENCHING LIQUID
ACTUATOR IN QUENCH SECTION

HAZARDS LIKE QUENCH TANKS...

NEED THIS

SPECIAL FIRE PROTECTION!

IN THE PLAN ABOVE, you see a typical Kidde fire extinguishing system installation for the protection of one of industry's most dangerous fire hazards. However, *all* Kidde quench tank installations are not exactly like this one, since Kidde treats each quench tank as a *special* hazard which requires *special* fire protection!

Using safe, efficient carbon dioxide, Kidde systems snuff flames quickly, cleanly. The CO_2 leaves no mess to harm machinery or equipment, will not even damage work-in-process. And, thanks to patented Kidde rate-of-temperature-rise detectors, Kidde systems remain on guard 24 hours a day, completely independent of outside power sources.

Kidde systems use no clumsy mechanical triggering methods, have no falling weights. Pneumatic or Electrical Control Heads insure instant and complete CO_2 discharge. The moving parts of a Kidde system are self-enclosed for safety, need no replacement after a fire, have easy-to-read visual indicators which show at a glance if system is "set" or "released." What's more, special Directional Valves on the Kidde system let you protect more than one hazard from the same cylinder bank, giving you the most versatile protection on the market!

Without obligating yourself in any way, let the Kidde man analyze the fire hazards in your plant. Then let him show you our recommendations. For more information, write Kidde today.

Kidde

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LETTERS
TO THE EDITORS

Comments on Yearbook

I have noted with interest that your 1956 yearbook has been published (Jan. 2). I believe your Technical Forum section (page 195) is noteworthy. I appreciate the privilege to have been considered as a contributor to this work.

C. W. Schwartz
Technical Director
Misco Precision Casting Co.
Division of Consolidated Foundry & Mfg. Corp.
Whitehall, Mich.

Please forward three copies of the article, "What Metalworking Management Expects in 1956" (Jan. 2, page 105). I find it of utmost value.

Joseph B. Eldridge
Personnel Director
W. W. Cross & Co. Inc.
East Jaffrey, N. H.

May I have three copies of your report, "1956 Metalworking Facts and Figures" (Jan. 2, page 145)? They will be useful references for me and my friends in the metalworking section of our East Pittsburgh works.

N. Hunt Gwyn
Technical Publicity
Westinghouse Electric Corp.
Pittsburgh

In the Jan. 2 issue, I came across the article, "Expansioneering—How To Plan Your Growth" (page 101), and found it to be interesting. I would appreciate three copies.

J. F. Considine
Chief Methods & Layout Engineer
Convair
Fort Worth, Tex.

Believe me, I was flattered to see my picture in the 1956 Technical Forum (Jan. 2, page 195) among the many prominent men in the machine tool industry. It was indeed a pleasure and privilege to be a part of the forum. Best wishes for continued success.

W. C. Newberg
President
Dodge Division
Chrysler Corp.
Detroit

Way To Pay Salesmen

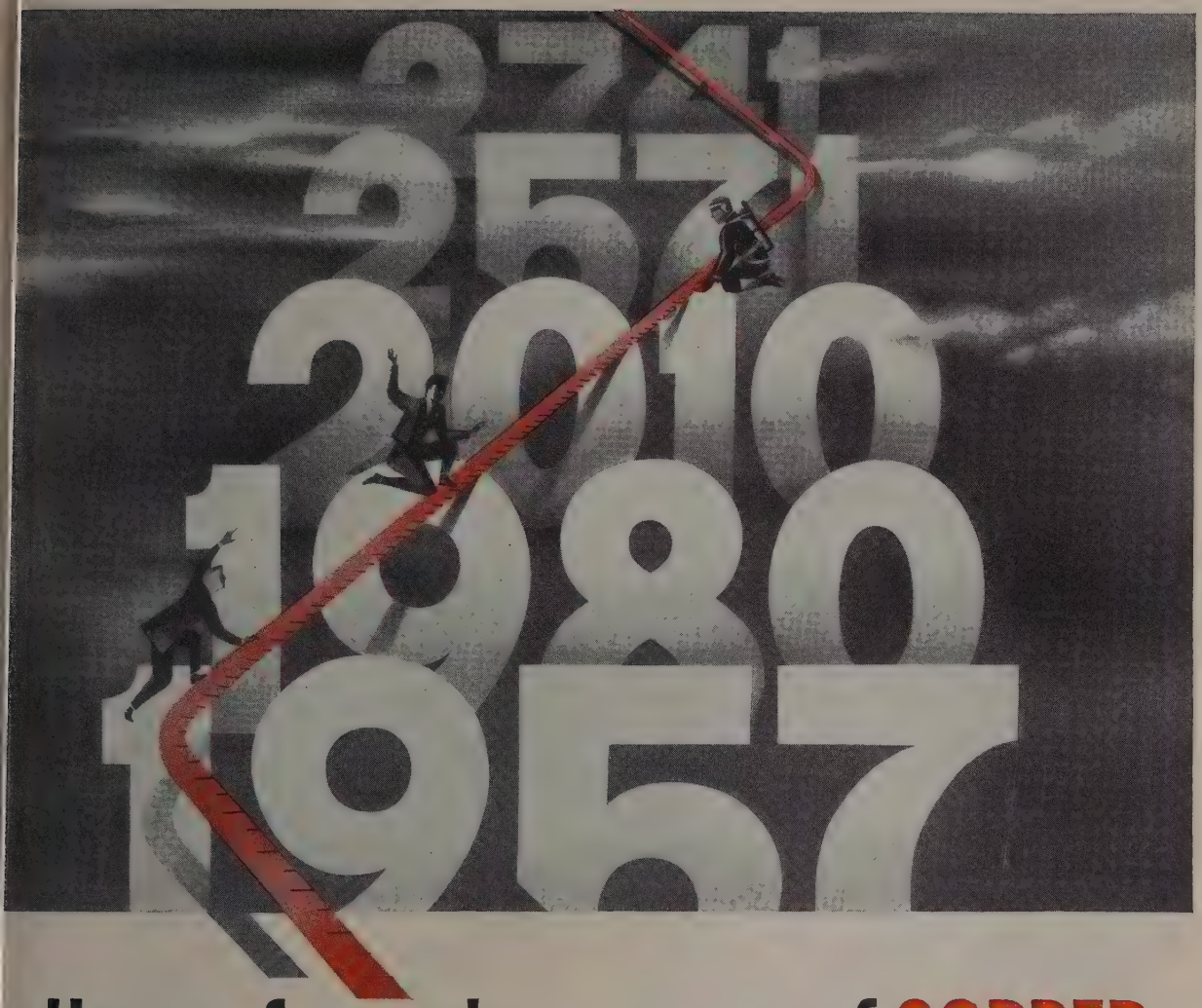
I read with pleasure the article, "How To Pay Salesmen" (Jan. 9, page 27).

I feel that a salesman for a steel warehouse should pay his own expenses and that he should receive a percentage of the difference in the cost of material (f.o.b. warehouse) and the price for which he got the material.

What the percentage should be, I am not able to determine, but I imagine the best way to figure the cost of material is the market price, which has nothing to do with actual price paid.

Also in a warehouse, there is a cer-

(Please turn to page 12)



How to figure the economy of COPPER

You can evaluate copper, very simply...by looking forward.

Not backward, to yesterday. Not inward, on the problems of today. But *forward*, to tomorrow.

For the economy of using copper is *ultimate* economy. What substitute costs less than copper . . . or gives you better value . . . whenever you can figure cost *by the year?*

The copper roof on Philadelphia's Christ Church is 200 years old. The hardware in Mount Vernon has been used since Colonial days. Copper water lines have been found in Egypt dating from 3400 B. C. And brass pipes in Boston's Parker House were originally installed in 1854.

What will people say about *your* product years after they've bought it? If you use copper, they will say what men have said through the ages: "See . . . it pays to buy *quality!*"

When the reputation of your product is involved, make it with copper! Copper & Brass Research Association, 420 Lexington Avenue, New York 17, New York.

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RESEARCH ASSOCIATION

. . . AN INDUSTRY SOURCE OF TECHNOLOGICAL AID, INCLUDING A LIBRARY OF TECHNICAL LITERATURE AND A COUNCIL OF SPECIALISTS

COPPER OR ITS ALLOYS PROVIDE THESE ADVANTAGES:

Best conductor of electricity commercially available

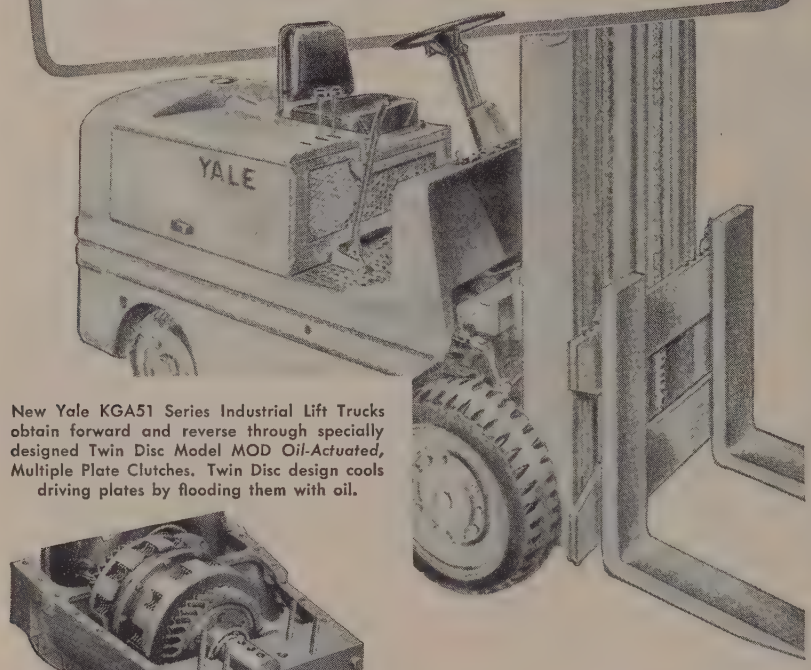
Does not rust . . . High corrosion resistance

Best heat transfer agent of all commercial metals

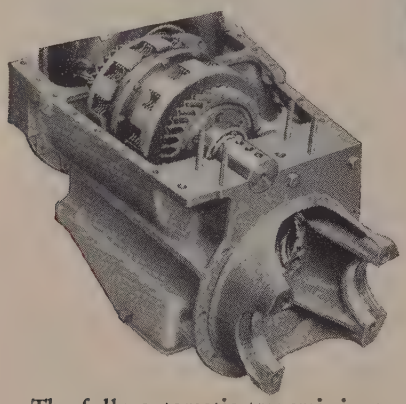
Easy to machine, form, draw, stamp, polish, plate, etc.

Welds readily . . . excellent for soldering and brazing

Forward and reverse on new Yale KGA51 Series obtained by specially designed TWIN DISC CLUTCHES



New Yale KGA51 Series Industrial Lift Trucks obtain forward and reverse through specially designed Twin Disc Model MOD *Oil-Actuated,* Multiple Plate Clutches. Twin Disc design cools driving plates by flooding them with oil.



The fully automatic transmissions in the new Yale KGA51 Series Industrial Lift Trucks obtain forward and reverse motion through specially designed Twin Disc Model MOD *Oil-Actuated,* Multiple Plate Clutches.

Because of the severe energy cycle of the vehicle, a specific clutch for finger-tip control was required. Twin Disc Engineers *worked closely* with the manufacturer in developing such a clutch. In the special Twin Disc design, oil is pumped through the shaft and cools the driving plates *by flooding them with oil.* Sintered friction material is also used, because of the high energy loading.

If you have a specific power linkage problem, on your powered equipment, consult Twin Disc Specialists . . . ask them to assign you a project engineer. Twin Disc Clutch Company, Racine, Wisconsin.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Friction Clutches and Fluid Drives

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin - HYDRAULIC DIVISION, Rockford, Illinois
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LETTERS

(Concluded from page 10)

tain amount of work done on steel—rolling, shaping, flame cutting, etc.—that has to be brought into the system.

Steel warehouses are a large part of the steel industry, and it might be well to take a look at this method of remuneration.

W. Wallace McKaig
McKaig
Cumberland, Md

Please send three copies. Your early attention will be appreciated because we are setting up a supplementary sales program.

William T. Steele
Sales Manager
Fan and Castline Division
Progress Mfg. Co. Inc.
Philadelphia

Appliance Merry-Go-Round

We are interested in receiving two copies of the article, "Appliance Sales Whirl" (Dec. 19, page 48). Your magazine has been helpful to us.

W. W. Godard
General Supervisor
Statistical Section
Cleveland Electric Illuminating Co.
Cleveland

Company Uses Re-Equip Guide

At our request several weeks ago you sent us 50 copies of your Simplified Guide for Re-Equipment worksheet. We have found these helpful to our organization and would appreciate receiving 100 more. Our Brooklyn and Buffalo plants may need a few extra copies in the future.

We would also like six reprints of the article in your June 20 issue "When To Re-Equip" (page 99), which covers the machine tool replacement guide.

T. R. Dreyer
Vice President
Manufacturing Division
American Machine & Foundry Co.
New York

Since this article presents a theory of large interest to several members of this organization, we would appreciate having three copies.

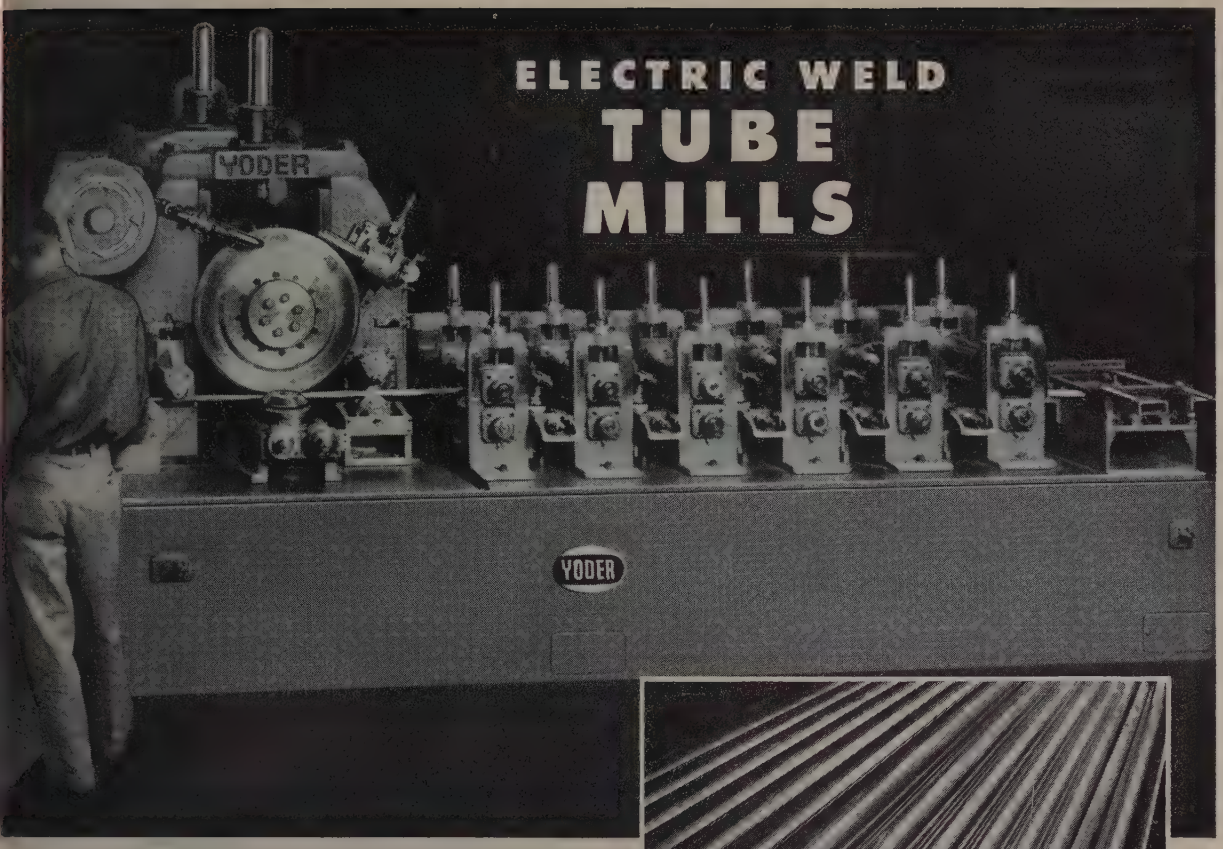
George Stead
Manufacturing Engineer
Porter-Cable Machine Co.
Syracuse, N. Y.

Metal Selector Is Informative

I find that the Metal Selector is helpful and informative. Many of the people I come in contact with have asked me for a copy, and I would like to be able to oblige. Please send 10 copies.

Ben Yute
Manufacturers Representative
3042 Avenue V
Brooklyn 29, N. Y.

ELECTRIC WELD TUBE MILLS



The photo shows the tube forming mill and welder of a complete Yoder mill recently installed for an Italian customer. Although it looks very much like a standard Yoder mill, it embodies special mechanical and electrical innovations designed for *tube production at speeds up to 350 fpm*—from 200 to 300% faster than heretofore considered practical by the resistance-weld process.

This is just one example of the many new things introduced by Yoder in pipe and tube making equipment, to meet widely varying production needs. Other recent Yoder developments are induction weld mills for making steel as well as nonferrous pipe and tubing, at speeds never before approached by this process, and adding greatly to its recognized economic advantages.

For more complete information about the latest technological advances in Yoder tube mill equipment, write, wire or phone

THE YODER COMPANY

5502 Walworth Ave. • Cleveland 2, Ohio

Literature on Request:

- ☐ **1.** Electric Weld Tube Mills for *Steel Tubes* up to 4" diameter.
- ☐ **2.** *Induction Weld* Tube Mills—sizes up to 8" diameter for aluminum, nickel, copper, brass, inconel, monel, stainless and other alloys.
- ☐ **3.** *Pipe Mills*—electric weld—for sizes up to 24" diameter.

ENGINEERING YODER MANUFACTURING

PIPE AND TUBE MILLS—Electric Weld

ROTARY SLITTING LINES

COLD ROLL FORMING MACHINES

Two of the Steelweld Presses in action. These are Model K5-10 machines rated for 12'-0" x 3/8" steel plate. Note how Cleveland Tramrail cranes serve these presses.

Battery of STEELWELD PRESSES and SHEARS Aids Caterpillar Production

Shearing long ½-inch thick strips into small rectangles on a Series 8D-10 Steelweld. The long extension squaring arm at front facilitates this work.

THOUSANDS of tons of steel of different thicknesses are sheared and formed on Steelweld Shears and Presses into various shapes required for the large volume of tractor equipment produced at the new Joliet, Illinois, plant of Caterpillar Tractor Co. These items include scrapers, rippers, bulldozer blades and wagons.

The heavy construction of Steelweld machines and many high quality features with which they are provided make possible continuous trouble-free performance. Their design includes a number of innovations which ease operation, speed production and enable accuracy to close tolerances.

The fact that Caterpillar has bought Steelweld Shears and Presses repeatedly and now has a large battery of them is mute testimony to the satisfaction they are giving.

GET THESE BOOKS!

Catalogs No. 1010 (Presses) and No. 1011 (Shears) give construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7850 EAST 281ST STREET, WICKLIFFE, OHIO

STEELWELD

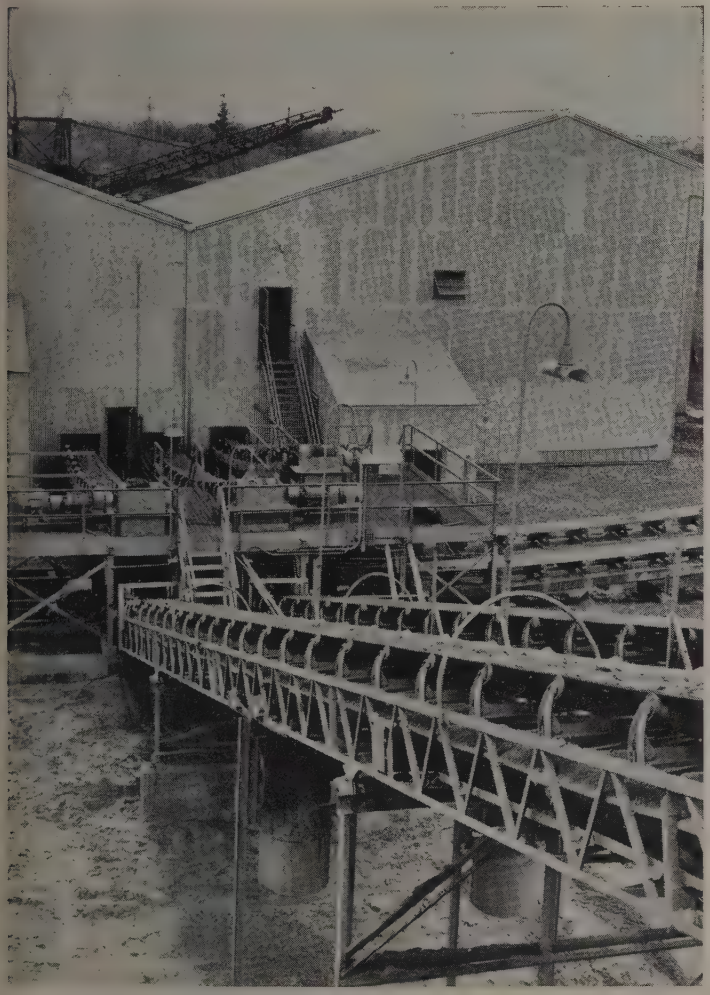
PRESSES and SHEARS

LOWER COST PER TON-MILE

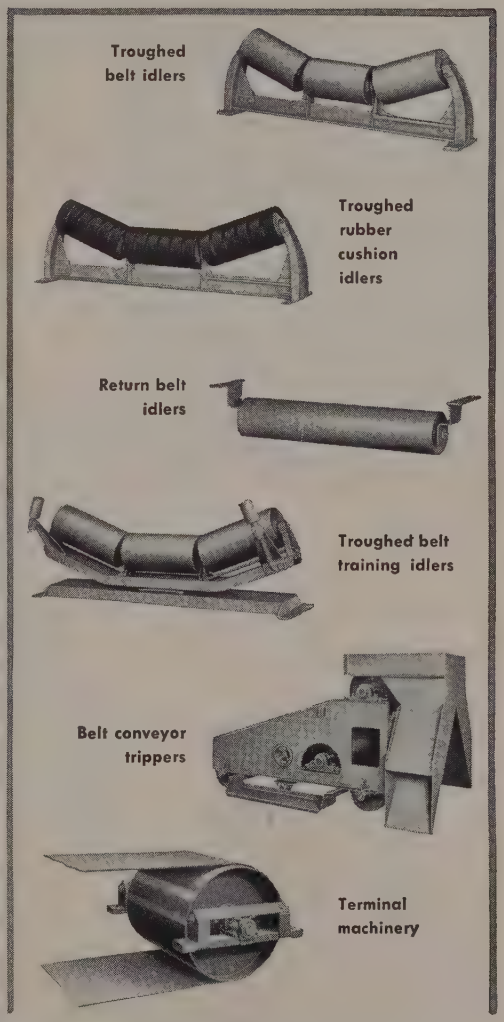
. . . yours with either a Link-Belt single belt conveyor or complete system

WHETHER you need a single belt conveyor or complete system, you'll find that Link-Belt engineering and equipment add up to lower cost per ton mile. Drawing from vast experience, our engineers can develop a system incorporating the most practical components from our complete line of quality idlers, trippers, drives, terminal machinery and other items. And if desired, we will handle erection.

Link-Belt has pioneered the development of belt conveyors for short or long hauls . . . indoor or outdoor service. To learn how this background can produce utmost economy per ton-mile in handling your bulk material, call your Link-Belt office.



Link-Belt 30-in. wide belt conveyors handling iron ore concentrate and tailings from washing plant to railroad and truck loading hoppers.



Link-Belt offers you one source for all equipment—including 500 idler sizes in 35 types . . . plus pulleys, drives, trippers and supports. Whatever the weight of loads, atmospheric factors or other operating conditions, you're assured of the easiest and most practical integration of belt conveyors into your overall system requirements.

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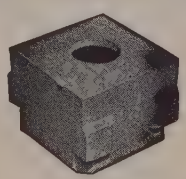

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♦ Application limitations overcome by vinyl compounds developed by United Chromium . . .

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Unichrome Coating 4129 solves the problem of economical dipping of wire goods. It permits dipping at room temperature . . . 3 times faster than previous cold dip compounds, and using only half as much plastisol material. Refrigerator shelves, freezer baskets and the like are now getting the better protection of plastisols more economically.

In these two singled-out examples, you see what United Chromium strives to do with all its metallic finishes, organic coatings, dip finishes and equipment . . . to help you cut finishing production cost, or produce a superior product through a better finish. We'd welcome an opportunity to work with you.

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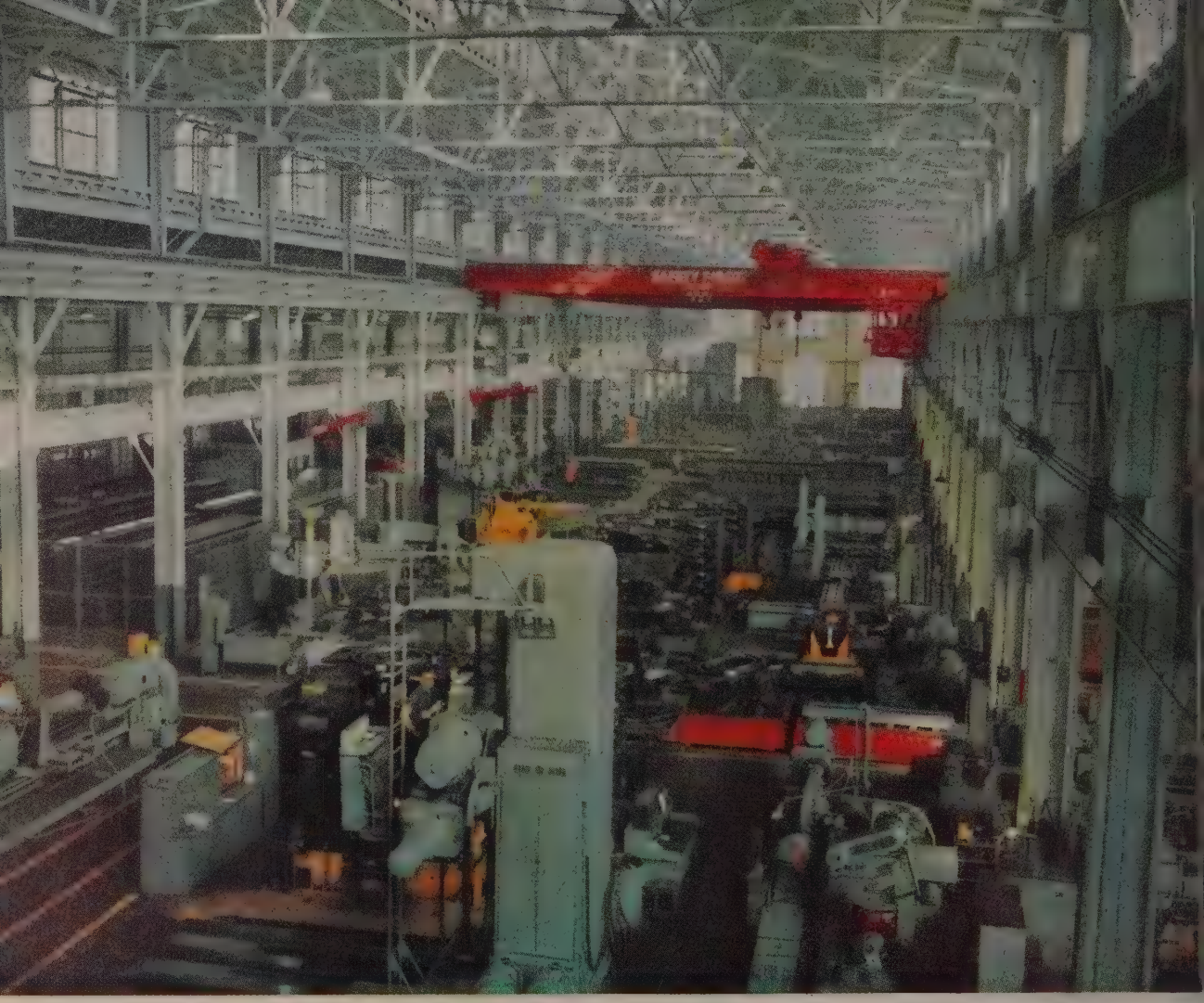

ANOTHER *expansion* FOR AETNA-STANDARD

● Aetna-Standard's fourth major expansion in 15 years expands production capacity by 40%.

The expansion increases machining, welding and assembly facilities with more floor space and new machine tools. A new power plant moves the KVA load from 2600 to 3050 KVA capacity.

The continued demand for steel, copper, brass, aluminum, rubber and plastic requires more and more production machinery, such as Aetna-Standard designs and manufactures. Capacity to produce more equipment is **a responsibility** of the machinery manufacturer who depends upon these basic industries for his orders.

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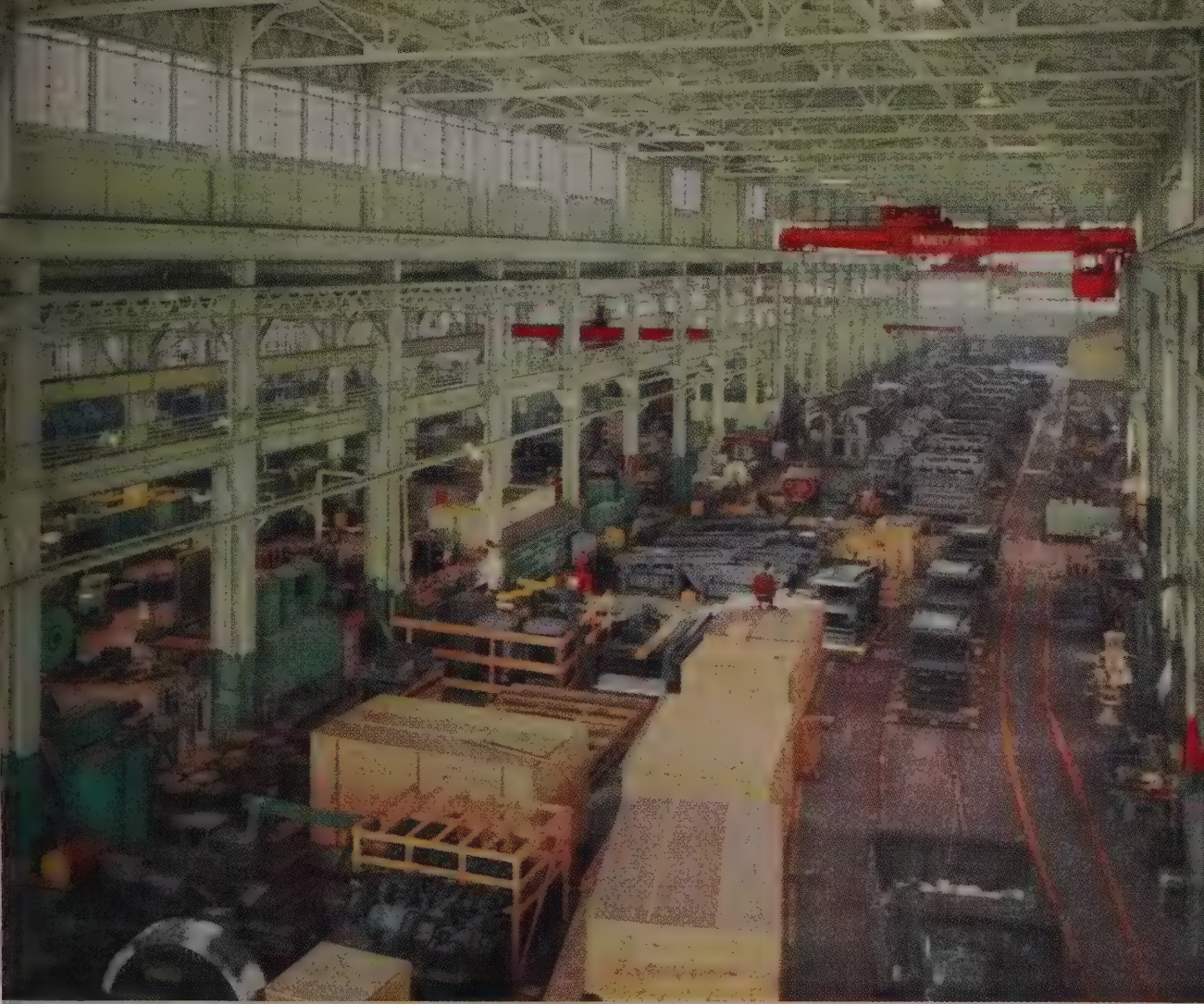

BIG FACILITIES

WITH PRECISION TOOLS AND WORKMANSHIP

● This is one section of Aetna-Standard's big ant at Ellwood City, Pa. A detail would reveal big planers d small planers; turret lathes and boring mills; a toolmak- 's shop and a pattern shop; a foundry and several assembly ys . . . welders, fitters, electricians and other craftsmen.

You would see all types of weldments coming from the g weld shop. You would see many machinists at work. ou would see excellent facilities inside the plant for ipping by rail or truck.

To manufacture pipe and tube mills, galvanizing lines, drawbenches, shear lines and other basic production machinery, requires big facilities, precision tools and workmanship.

To meet their responsibility to customers in steel, copper, brass, aluminum, rubber and plastic, Aetna-Standard in recent months has increased its productive capacity by 40%, the fourth major expansion in 15 years.

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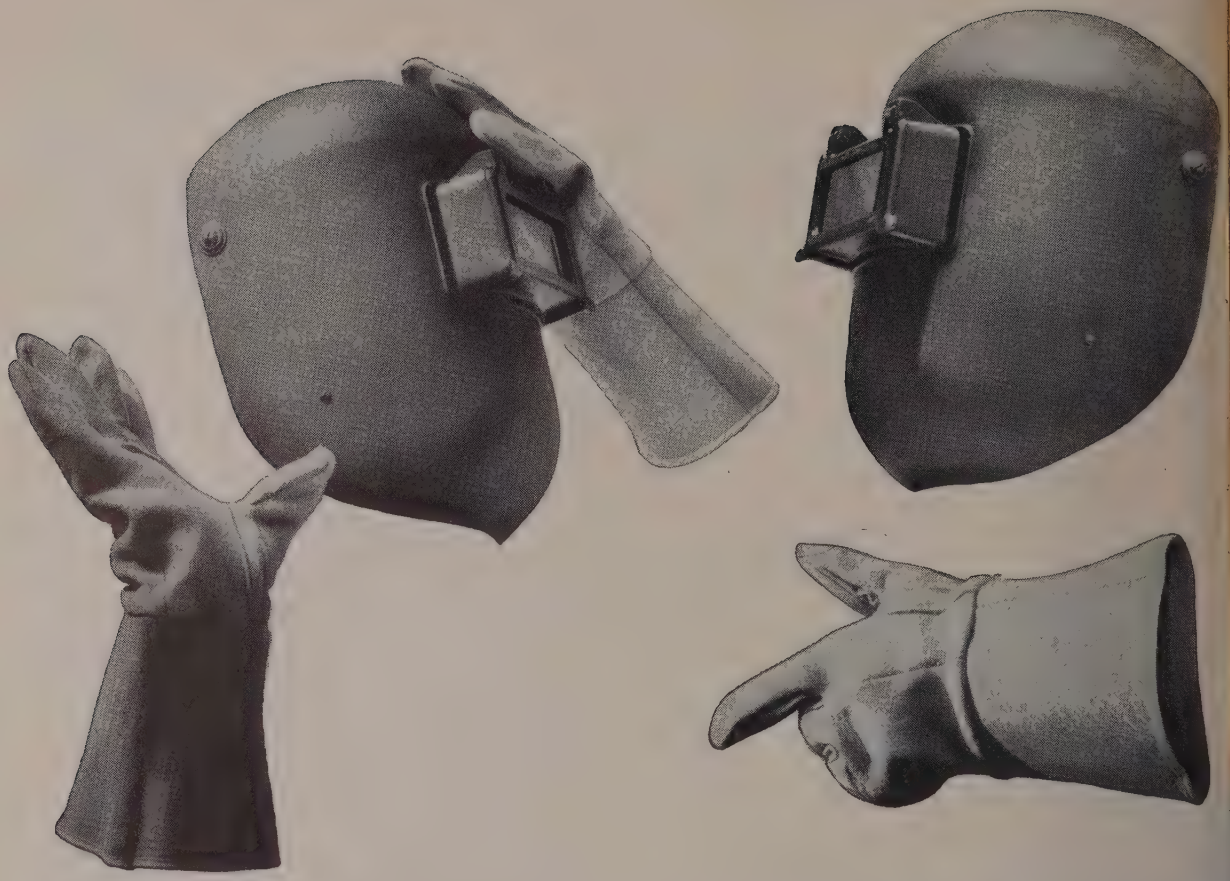

WHAT—*HANDLES LIKE CARBON STEEL?*

That's right. 3 times stronger than carbon steel, Lukens "T-1" steel can be readily welded without special joint designs or procedures.

Although Lukens "T-1" steel is a tough, high strength, heat treated steel, equipment builders will find that the techniques of working with this new steel are no different than with carbon steel. Recognizing that higher strength steels require higher pressures to form, proper design procedures will permit this low carbon, quenched and tempered alloy plate steel to be fabricated not only in the shop but also in the field. Those items of equipment which may not have to be stress relieved for dimensional stability or other special reasons can be fabricated of Lukens "T-1" steel to take advantage of its tough "as-welded" characteristics.

In addition to easy fabrication, Lukens "T-1" steel has other benefits of equal value to equipment builders. Three times stronger than carbon steel, this new steel has lighter weight and reduced thickness in comparison to heavier, thicker plates of carbon steel, thereby reducing material, fabrication and shipping costs. Lukens "T-1" steel's excellent resistance to the combination of wear and impact abuse lowers maintenance and replacement costs, lengthens equipment life. Lukens' range of steel plate sizes—including the widest and heaviest plates available anywhere—makes possible additional savings for builders through the use of wider plates that require fewer welded seams.

A new addition to Lukens' complete line of carbon, alloy and clad steels, this new steel's unusual combination of properties suit it especially to applications in pressure vessels, bridges, shipbuilding, construction machinery and general industrial equipment. On problems of design, material selection, application and fabrication techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write to Manager, Marketing Service, 773 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania.

LUKENS

"T-1" STEEL

To get the new, 28-page book on Lukens "T-1" steel, ask for Bulletin 781.

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LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

this CINCINNATI PRESS BRAKE

is giving accurate and versatile performance at

UNITED STEEL FABRICATORS, Inc.

With ample capacity, this powerful 500 Series Cincinnati Press Brake with 18″ 6″ clearance between housings and 22′ die area—handles formed structural bridge flooring, guard rails, steel doors, Girders, and side walls for various types of metal buildings are also produced.

United Steel Fabricators, Inc. are pleased with the accuracy in forming and ease and speed of operation which are important factors in this economical production.

INVESTIGATE:

—Cincinnati Center Line Loading

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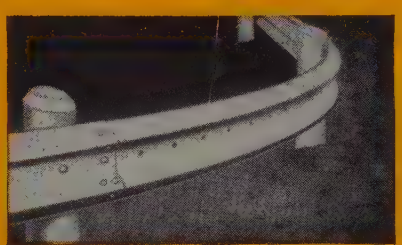
—Cincinnati Rigid Deep Beds and Rams

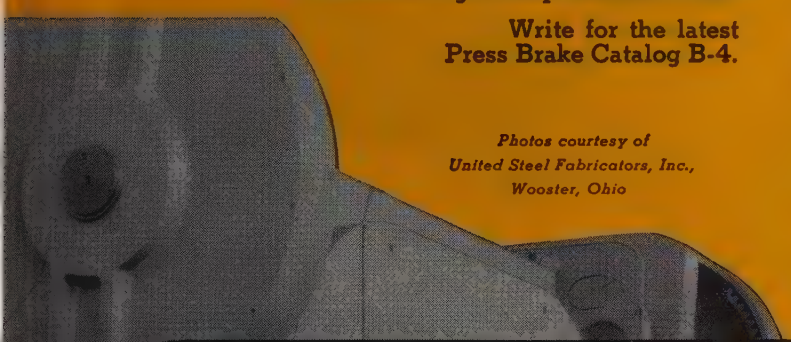
Write for the latest Press Brake Catalog B-4.

Formed structural bridge flooring



Barrier beam guard rail formed to any radius desired

Photos courtesy of United Steel Fabricators, Inc., Wooster, Ohio



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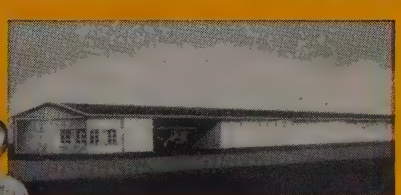

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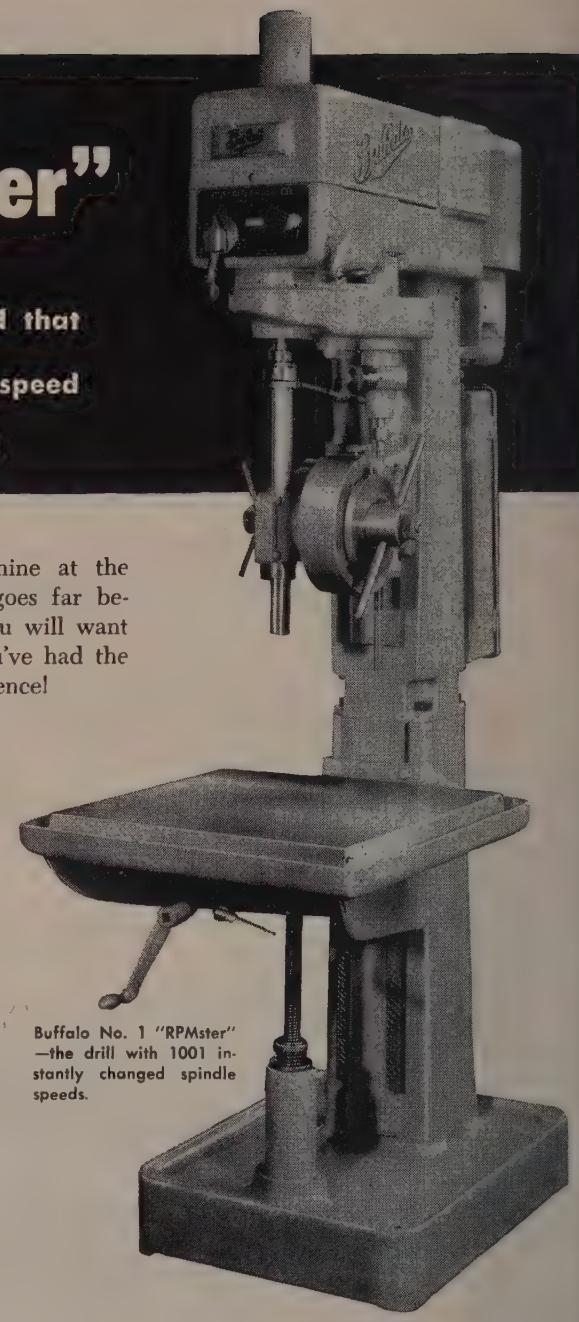
- . . . So smooth in feed and spindle speed adjustment!
- . . . So responsive to your commands!



Those who saw this great new drilling machine at the NMTBA Show will verify it. The "RPMster" goes far beyond the ordinary concept of a "drillpress". You will want to have one or more working for you, after you've had the experience of operating one—and it is an experience!

First, its gearless drive and perfectly fitted spindle provide extreme smoothness and quietness of operation.

Second, you can instantly get any low range spindle speed from 100 to 550 R.P.M.s at the touch of a lever—and, by switching to high range in a few seconds, any speed from 500 to 3000 R.P.M.s. Here is the really versatile machine for smooth work flow through the wide range of drilling, reaming and tapping operations.

Buffalo No. 1 "RPMster" —the drill with 1001 instantly changed spindle speeds.

And as the "Buffalo" power feed obeys your touch, you know you're completely in command of this powerful 88" high machine. The "RPMster" lives up in every way to the "Buffalo" "Q" Factor* standard of performance.

Your nearby "Buffalo" representative will be glad to arrange a demonstration, or write us.

***The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.**

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

CALENDAR
OF MEETINGS

Jan. 30-Feb. 3, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Feb. 1-2, Midwest Welding Conference: Armour Research Foundation, Illinois Institute of Technology, Chicago. Information: Harry Schwartzbart, Armour Research Foundation, 35 W. 33rd St., Chicago 16, Ill.

Feb. 6-8, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

Feb. 9-10, Steel Kitchen Cabinet Manufacturers Association: Spring meeting, Waldorf-Astoria, New York. Association's address: 1008 Engineers Bldg., Cleveland 14, O. Secretary: Arthur J. Tuscany Jr.

Feb. 13-17, American Society of Civil Engineers: Winter meeting, Baker hotel, Dallas. Society's address: 33 W. 39th St., New York, N. Y. Secretary: William N. Wisely.

Feb. 15-17, American Management Association: Personnel conference, Palmer House, Chicago. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

Feb. 16-17, Drop Forging Association: Winter industry meeting, Park Sheraton hotel, New York. Association's address: 419 S. Walnut St., Lansing, Mich. Executive vice president: Edgar L. Harden.

Feb. 16-17, Eastern States Blast Furnace & Coke Oven Association: Winter meeting, William Penn hotel, Pittsburgh. Information: B. W. Norton, Shenango Furnace Co., Sharpsville, Pa.

Feb. 19-23, American Institute of Mining & Metallurgical Engineers: Annual meeting. Hotels Statler and New Yorker, New York. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: E. O. Kirkendall.

Feb. 20-22, Association of Iron & Steel Engineers: West Coast meeting, Hotel Statler, Los Angeles. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Feb. 26-29, American Institute of Chemical Engineers: Winter meeting, Hotel Statler Los Angeles. Institute's address: 120 E 41st St., New York 17, N. Y. Secretary: F. J. Van Antwerpen.

Feb. 27-29, American Management Association: Annual electronics conference and exhibit, Hotel Commodore, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: J. O. Rice.

Feb. 27-Mar. 2, American Society for Testing Materials: Committee week, Hotel Statler, Buffalo. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Mar. 5-6, Instrument Society of America, Pittsburgh section: Conference on instrumentation for the iron and steel industry, Hotel Webster Hall and Mellon Institute of Industrial Research. Society's address: 845 Ridge Ave., Pittsburgh 12, Pa. Secretary: Fred Marton.

Mar. 6-8, Society of Automotive Engineers Inc.: National passenger car, body and materials meeting, Hotel Statler, Detroit. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Mar. 11-14, National Association of Waste Material Dealers Inc.: Annual meeting, Waldorf-Astoria, New York. Association's address: 271 Madison Ave., New York 16, N. Y. Managing director: Clinton M. White.

Mar. 12-14, International Acetylene Association: Annual meeting, Hotel Statler, Los Angeles. Association's address: 30 E. 42nd St., New York 17, N. Y. Secretary: H. F. Reinhard.

Mar. 12-15, National Electrical Manufacturers Association: Mid-winter meeting, Edgewater Beach hotel, Chicago. Association's address: 155 E. 44th St., New York 17, N. Y. Managing director: Joseph F. Miller.

"LITTLE STEVE" PAYS OFF

THE FINISHING TOUCH

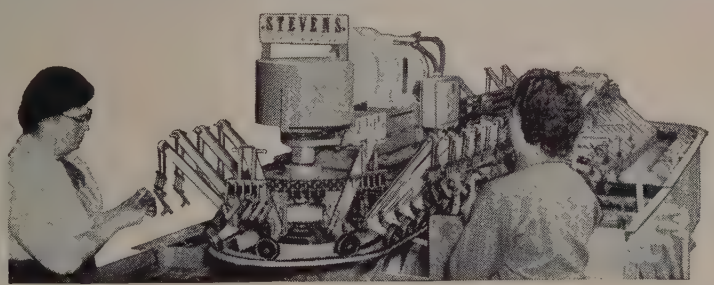
by A. B. HOEFER
vice president
FREDERIC B. STEVENS, INC.

Production Plater Finds Machine Ideal For Zinc Plating

There's a feeling of satisfaction among the people in our company when a Stevens machine is installed and does a better job than the customer anticipated. That feeling reaches all the way from President through engineers, salesmen and typists who write up the specifications.

We are particularly proud of an installation of one of our "Little Steve" machines made recently for the Miller-Smith Manufacturing Company, Spring Lake, Michigan. The partners, John Miller and George Smith, are operating an aggressive business in job buffing and plating, and after receiving some of our literature including a story on the "Little Steve," soon made a purchase from us.

The "Little Steve" fit ideally into their program. The capital outlay met their requirements and the machine is daily turning out a big quantity of zinc plated parts for them. In fact, 105,000 can be plated each working day, which right now is an around-the-clock operation. Just as soon as new racks are built they expect to double present production on some of the parts.



The Miller-Smith management tell us that they are operating much more efficiently now than they did previously with a competitive machine. Parts are being zinc plated to a .0002 thickness every three minutes. They are saving on valuable floor space too, for the "Little Steve" occupies only 162 square feet as compared to 441 square feet used by their previous equipment.

When we asked for comments about the "Little Steve" from Messrs. Miller and Smith, they said: "We are well pleased with the machine —in fact, we're proud of it. We'll be glad to recommend it to anyone." While we are not unused to such comments on our various machines, each new one gives us a warm glow of satisfaction.

This efficient machine fits easily into existing factory layouts because of its size. Only seven feet wide and ten or more feet in length, it can be placed on a factory floor without moving existing machinery.

For further information write to Frederic B. Stevens, Inc., Detroit 16, Michigan.

FREDERIC B. STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

METAL FINISHING EQUIPMENT AND SUPPLIES
FROM CASTINGS OR STAMPINGS TO
FINISHED PRODUCT

BRANCHES:
Buffalo • Cleveland • Indianapolis • New Haven

ROSS®

EXCHANGERS SPECIFIED FOR ENTIRE NEW LINE OF LAKE ERIE DIE CASTING MACHINES

Termed "expandable", Lake Erie's new Series D Die Casters have been introduced as simplified machines to which special features can be added as needed. *Only essentials for normal production are included.*

One of these *essentials* is a Ross Type BCF Exchanger. Hydraulic oil temperatures won't get out of hand to cause pump slippage here!

"In our effort to build an economical machine with rugged characteristics and top quality, it was only natural that we selected Ross oil coolers as part of the basic equipment," says Lake Erie Engineering Corporation.

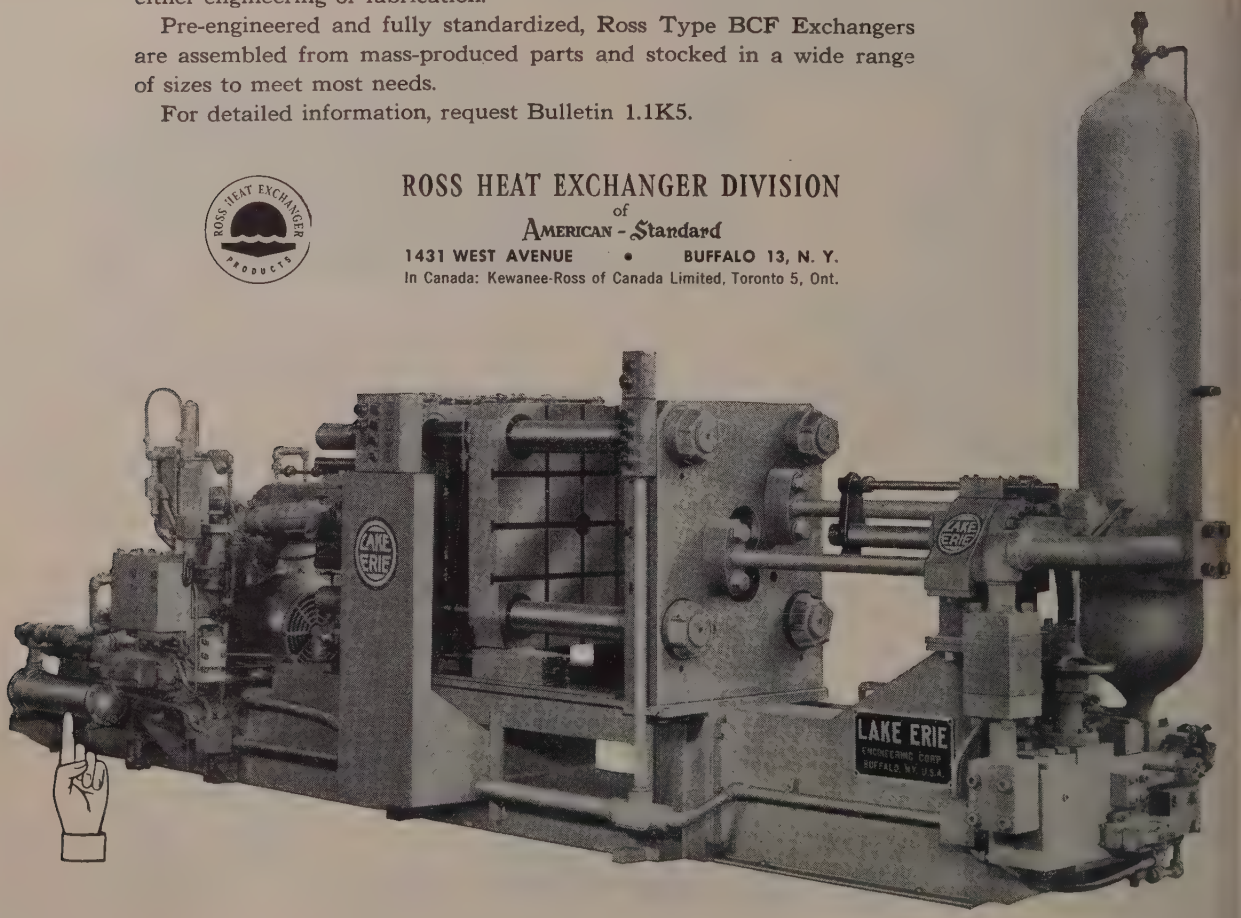
Specifications for numerous types and makes of hydraulic machines regularly call for Ross Exchangers. In this way, top-rated thermal efficiency and ruggedness are both assured without costly "specials" in either engineering or fabrication.

Pre-engineered and fully standardized, Ross Type BCF Exchangers are assembled from mass-produced parts and stocked in a wide range of sizes to meet most needs.

For detailed information, request Bulletin 1.1K5.

ROSS HEAT EXCHANGER PRODUCTS

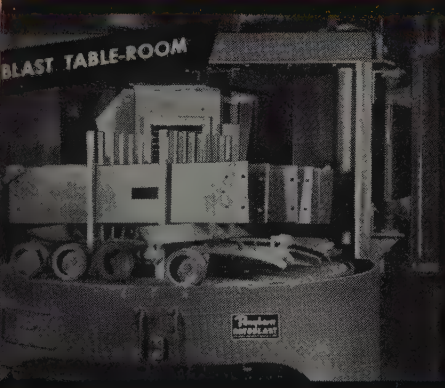
ROSS HEAT EXCHANGER DIVISION
of
AMERICAN - Standard
1431 WEST AVENUE • BUFFALO 13, N. Y.
In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.



Faster...

better...

cheaper...



Faster, better, cheaper—these are no empty claims. There are sound reasons why Pangborn Rotoblast offers these benefits. Rotoblast gives you faster blast cleaning because it throws a greater volume of abrasive over a specific area in less time. It does better cleaning because its cleaning action is uniform, scouring surfaces to a bright, gleaming finish. It cleans cheaper because, in addition to speed, Rotoblast saves labor costs and requires less power to operate. (Rotoblast is versatile, too, handling all kinds and sizes of products!) Investigate Pangborn Rotoblast now!

that's blast cleaning with Pangborn Rotoblast® !

Send for free copy of Bulletin 227 today! The few minutes you take to write can save you thousands of dollars annually. Write PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment.*

Pangborn

BLAST CLEANS CHEAPER

Rotoblast Blastmaster® & Continuous-Flo Barrel

Rotoblast Tables & Table-Rooms

Special Blast Rooms & Cabinets

Pangborn Dust Control Equipment

Malleabrasive Shot & Grit

20

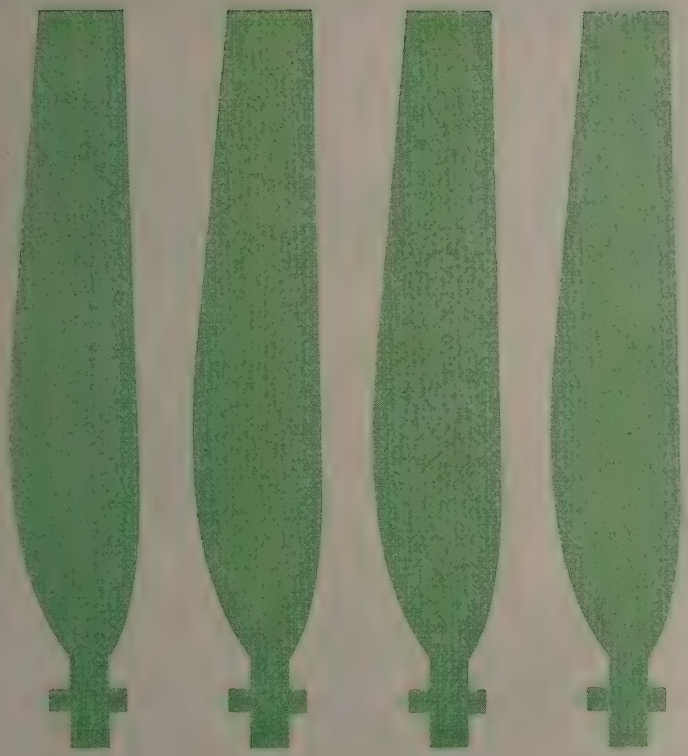
hydraulic planers

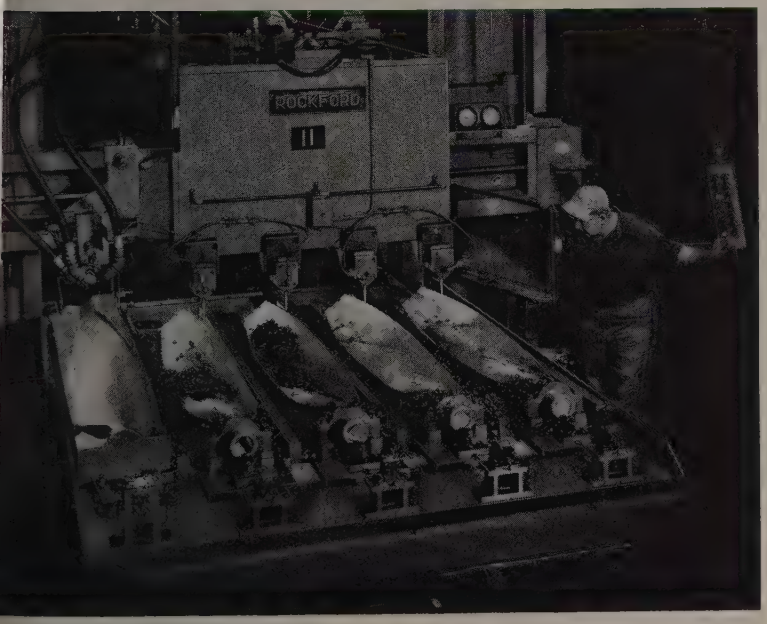
equipped with Kopy-Kat duplicators

mass-duplicate airfoil

for propeller blades

ROCKFORD MACHINE TOOL CO.





Here's another example of Hydraulic Planers at work. This battery of twenty Hydraulic Planers, equipped with Kopy-Kats, machines propeller blades. The machine shown in the closeup is finishing four blades simultaneously from one master. The inherent advantages of Hydraulic drive make this gigantic installation an extremely powerful production unit.

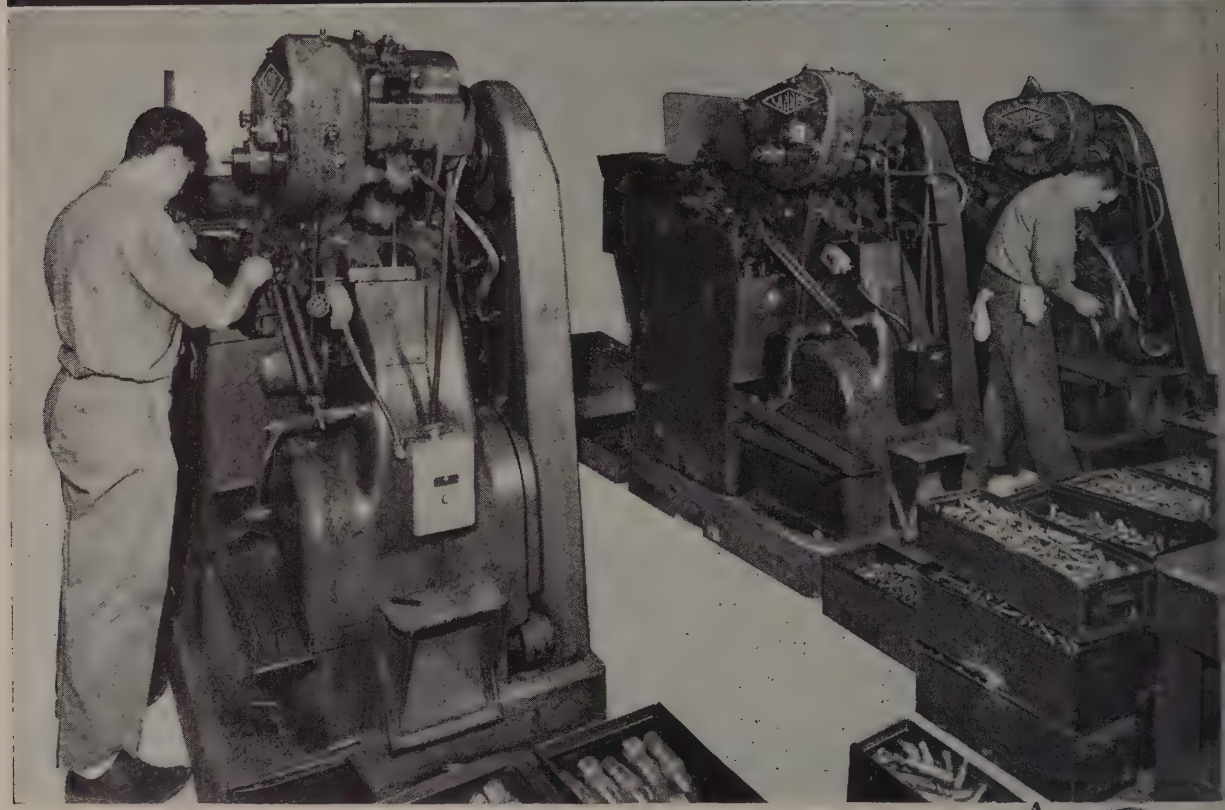
Hydraulic Drive is a natural for reciprocating machine tools. It's being proven daily in the world's finest machine shops. Ask a Rockford Machine Tool Co. representative for the facts on modern Hydraulic Shapers, Planers, Slotters, Shaper-Planers and Kopy-Kats.

2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

Hy-Draulic

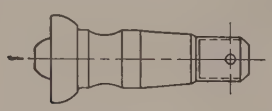
Reg. U. S. Pat. Off.

LANDIS *Automatic* PROVED BY PRODUCTION . . . .



Points and Threads 1020 Ball Studs per hour

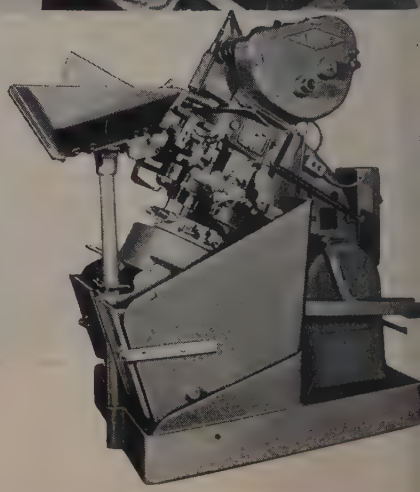
Through the use of LANDIS Automatic Forming and Threading Machines, a large manufacturer has solved his problem of mass-producing certain automotive parts.



The workpieces are cold-forged blanks, from which ball studs are made. Specifications require a 45° point and a 9/16" 18-pitch N.F. thread cut to a length of 5/8". In constant daily operation is a battery of LANDIS Automatic Forming and Threading Machines, each of which point and thread 1020 pieces per hour. Four hours of production are obtained between each chaser grinding, resulting in low tool cost and minimum machine down time.

Because of their universal features, LANDIS Automatic Forming and Threading Machines are adaptable to mass-production operations on a wide range of automotive parts. By means of pick-off speed change gears, the machine cycle can be varied to accommodate any combination of thread length, pitch, and thread diameter, within the capacity of the machine—therefore this machine is adaptable to a wide variety of work. Hopper feed and automatic operation throughout enable one operator to keep a battery of machines in constant production, while set-up changes of all types can be made in minimum time.

Can you revolutionize your pointing and threading operations with LANDIS Automatic Forming and Threading Machines? Please give specifications when writing for complete information.



LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

COUNT ON YOUR WICKWIRE ROPE DISTRIBUTOR FOR ENGINEERING ASSISTANCE

When it's a question of wire rope, the place to go is to your Wickwire Rope distributor. He knows your requirements. He knows wire rope and how it can be used to best advantage. In addition, he can provide you with this important extra—the technical assistance of Wickwire Sales Engineers. With the additional help of these capable specialists, he can give you expert, practical advice on even the toughest wire rope problems.

Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and wire rope slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

3150

Caught in the middle?

If grinding problems have you caught in the middle and you don't know which way to turn, switch to CINCINNATI (PD) WHEELS. For *now* CINCINNATI Grinding Wheels offer POSITIVE DUPLICATION —a remarkable achievement in precision manufacturing and quality control that *can save you money . . . and increase your production.*

Here's why you'll stop leading a dog's life when CINCINNATI (PD) WHEELS are on the job: Through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.* So, we think you'll agree it's worth taking a close look at CINCINNATI (PD) WHEELS right away.

Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

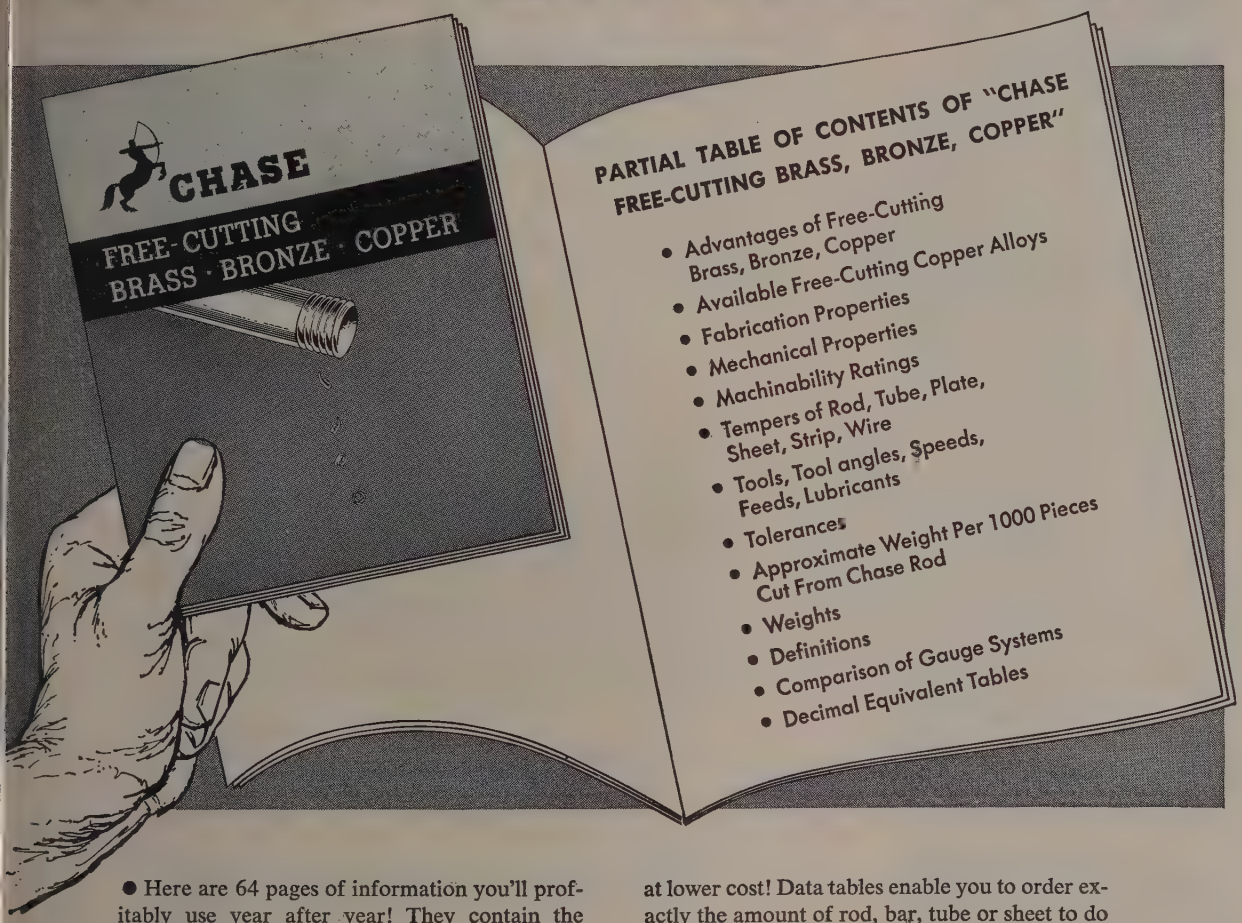
Remember—*only* CINCINNATI Grinding Wheels give you . . .

(PD) POSITIVE DUPLICATION

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

CINCINNATI *Grinding Wheels*

THIS FREE BOOKLET CAN CUT YOUR METALWORKING COSTS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FREE-CUTTING
BRASS · BRONZE · COPPER
PARTIAL TABLE OF CONTENTS OF "CHASE FREE-CUTTING BRASS, BRONZE, COPPER"
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• Available Free-Cutting Copper Alloys
• Fabrication Properties
• Mechanical Properties
• Machinability Ratings
• Tempers of Rod, Tube, Plate, Sheet, Strip, Wire
• Tools, Tool angles, Speeds, Feeds, Lubricants
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● Here are 64 pages of information you'll profitably use year after year! They contain the straight facts about all the easily-machined Chase brass, copper and bronze alloys.

"CHASE FREE-CUTTING BRASS, BRONZE, COPPER" will help you select the alloys best suited to make your products faster, better, and at lower cost! Data tables enable you to order exactly the amount of rod, bar, tube or sheet to do any given job.

SEE CHASE'S NEWEST MOVIE, TOO! "In The Chips" gives a demonstration of copper and its alloys in use. It was produced specifically for manufacturers of screw machine products.

The booklet is free! Movie showing is free, too! Send for them today!

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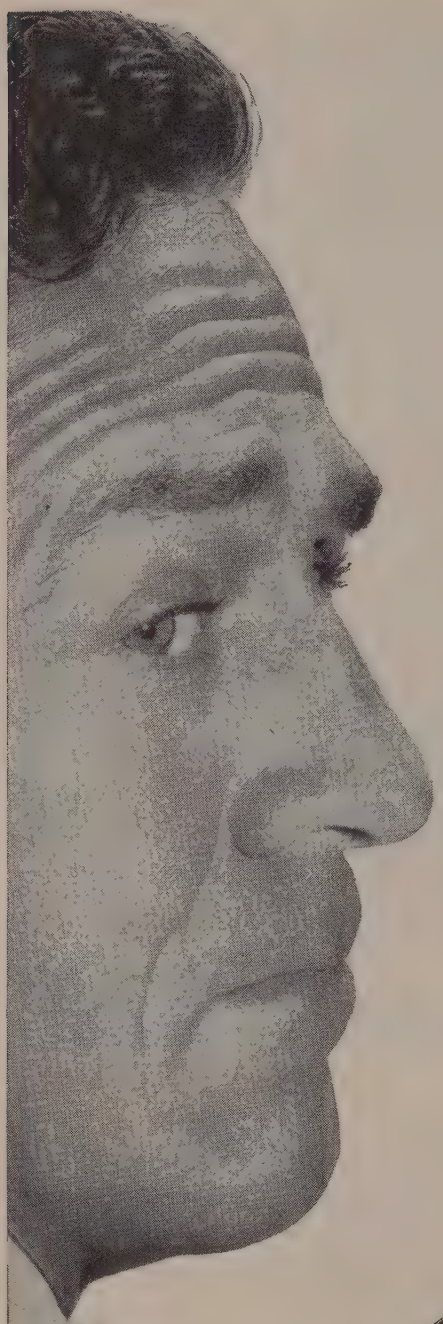
CHASE BRASS & COPPER CO. ST-156
WATERBURY 20, CONNECTICUT

Gentlemen: ☐ Please send me your free booklet: "CHASE FREE-CUTTING BRASS, BRONZE, COPPER"
☐ I would also like to see the movie, "In the Chips"

NAME .....
POSITION .....
FIRM .....
STREET .....
CITY ..... STATE.....



Do you really know the alloys you buy?

For instance, are you SURE of:

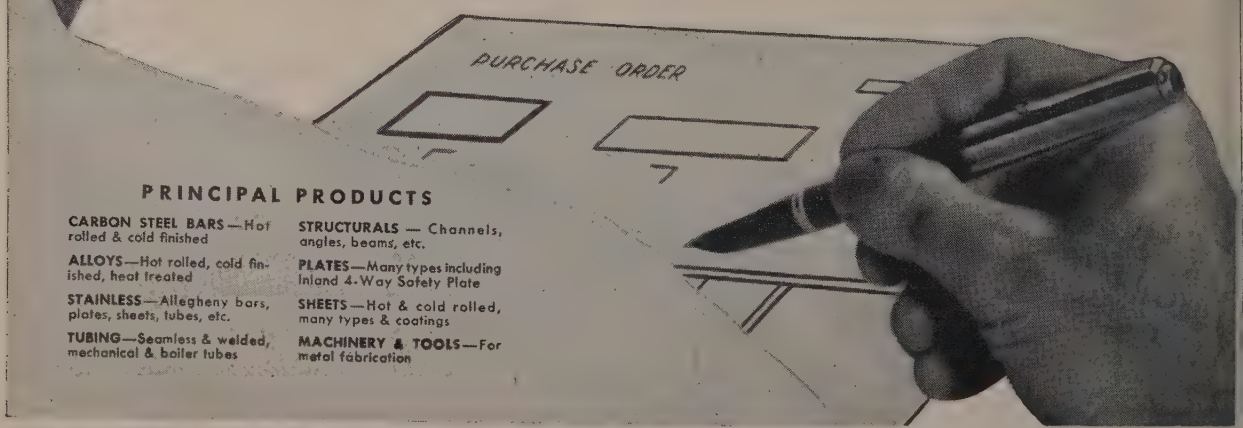
- **Heat identification** . . . not just type identification but the positive identification of your particular heat so you can be sure the alloy steel is everything it is supposed to be?
- **Chemical analysis** . . . not just the chemical range for the type, but the specific analysis of the heat from which your steel was rolled?
- **Hardenability** . . . not just the average hardenability for the type of alloy, but the actual test-proved hardenability of your particular heat of steel?

If you don't know these important facts, you may be in for trouble—loss of time and money; breakdown of equipment. It can happen when you're not sure of your alloys.

But when you work with Ryerson alloys you *can* be sure—sure of the steel you get, sure of what it will do—because Ryerson alloys are certified by an 8-step quality control program.

Every step has a specific purpose—every step is designed for your protection, but doesn't cost you a dime. For alloys with all questions answered, call your nearby Ryerson plant.

RYERSON STEEL



PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

TUBING—Seamless & welded, mechanical & boiler tubes

STRUCTURALS — Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal fabrication

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Metalworking Outlook

Steel Reports

The first steel company reports on 1955 net incomes show this: Republic —$86.3 million, compared with $52.9 million in 1954; Inland—$52.5 million, compared with $41.3 million; Pittsburgh Steel—$7.5 million, compared with $2.2 million; Lone Star Steel—$4.8 million, compared with a $1-million loss. So optimistic is Republic that it's boosting its expansion program from the previously announced $130 million to $152 million. The enlarged program will increase expansion to 1,776,000 annual ingot tons. When the program is completed, Republic's annual ingot capacity will total 12,038,000 tons. It's 10,262,000 tons now.

Shifts in Set-Asides

Here are the Office of Defense Mobilization's allotments of steel, copper and aluminum for "A" products in the second quarter: Steel—607,333 net tons (5 per cent lower than the first quarter); copper and copper-base alloys—54.6 million lb (9 per cent lower); aluminum—131.8 million lb (10 per cent higher). Although steel set-asides are down, stainless will be up—to 28.4 million lb. Increases in aluminum probably represent higher aircraft requirements.

Co-operative Coal

Watch for more coal companies to figure in co-operative deals like the one involving Pittsburgh Consolidation Coal Co. It will spend about $20 million to develop a mine and coal processing facilities to provide fuel for two power generating units at Cresap Bottom, W. Va. One will supply electricity for Olin Mathieson Chemical Corp.'s new aluminum plant across the Ohio river at Clarington, O. (see page 122). American Gas & Electric Co. will operate the power plants.

Lithium: On the Move

Watch lithium. A new application for defense (but not in atomic energy) holds promise of substantially increased consumption. Lithium is used as a mineral, metal or as a constituent in compounds, such as in the ferrous and nonferrous industries. Part of the furor about lithium comes from rumors that it may one day figure as a nuclear fuel. But the few nuclear experts who have commented on this say the use is still a question, not a fact.

GSA and United

General Services Administration wants Congress' advice on the sale of the government-owned New Castle, Pa., plant operated by United Engineering & Foundry Co. United has made a final offer which will be accepted if the Senate and House Government Operations Committees make no objection. The hooker in the deal is that the plant is being sold under provi-

sions of the National Industrial Reserve Act of 1948 which prevents a buyer from selling machinery and equipment essential to mobilization needs and prevents major conversion of the plant to other uses without the defense secretary's consent.

10% Dip in Housing?

Even if credit is eased, housing starts in 1956 may fall 8 to 10 per cent below the estimated 1.3 million in 1955. So predicts Roy Wenzlick, St. Louis building analyst. A hint that credit will be eased comes from the action by the Veterans and Federal Housing Administrations in restoring the 30-year terms on home loans. A 25-year maximum was ordered last July 30 to protect against inflation.

Sign of the Times

Where engineers comprised only 2.2 per cent of the typical aircraft company's total employment in World War II, the proportion of engineering employees has grown to more than 20 per cent of the total force. Other industries also are employing proportionately more. Proof of the fact is that the college recruiting quotas for engineers, chemists and physicists are up 47 per cent this year over last.

Testimony on Taxes

T. M. Evans, president of H. K. Porter Company Inc., said this to the Antitrust Subcommittee of the House Committee on the Judiciary: "It is both significant and dangerous that, of the 500 largest industrial corporations in this country, 2 per cent account for 30 per cent of the sales and assets. Concentration of economic power in such a comparatively few individuals, such as the heads of these giant corporations and the union leaders dealing with them, is not a good thing for the long-term outlook of our country. A logical way to control economic power is, in effect, to set a practical limit on the size a company may become by a graduated corporate income tax."

Pause That Refreshes?

Like the U.S., Canada is pausing to catch its economic breath as 1956 starts. Canadian unemployment is on the rise, but there are 210,000 more people working now than a year ago. Prospects for Canada (and the U.S.): An early spring pickup and a good year in 1956.

Straws in the Wind

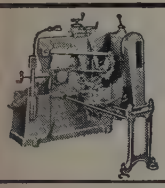
Norfolk & Western Railway is preparing economic studies as part of a campaign to interest an established steel firm or a new company in building a steel plant in the Roanoke, Va., area . . . General Electric Co. will enter the industrial computer field with establishment of an Industrial Computer Section at Syracuse, N. Y. . . . Plans to make the Volkswagen in the U.S. have been canceled . . . Losses due to strikes at 40 Westinghouse Electric Corp. plants through most of the fourth quarter amounted to $1,037,000.

Metal Sawing is of many types

Requiring, for efficiency, sawing machines of varying characteristics, capacities, feed pressures, speeds . . . even different blade actions. The complete MARVEL Line comprises various basic types of metal sawing machines to meet the requirements of all shops.

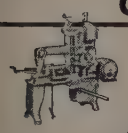
Engineered to your jobs by a MARVEL Sawing Engineer, a MARVEL Saw is certain to lower your sawing costs (both blade cost and cost per piece); to cut-off more accurately (both in length and squareness) and to out-produce any other sawing machine of comparable specifications.

PRODUCTION HACK SAWS



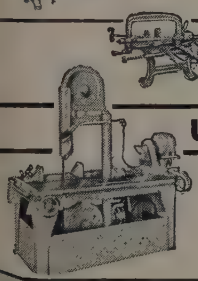
TYPE	CAPACITY	MODEL	GENERAL APPLICATION
HACK SAW Single Cut	6" x 6"	No. 6	These machines embody all of the modern design features of fine machine tools. They are recommended for constant heavy duty service, cutting all types of machinable metals. They should be selected whenever the work demands speed, accuracy, and stamina.
	10" x 10"	No. 9	
HACK SAW Automatic Bar Feed	6" x 6"	No. 6A	These automatic MARVEL saws use the No. 6 and No. 9 as a basic unit, but are modified to include an automatic mechanical bar feeding mechanism. Their purpose is to automatically "cut-up" long bars into multiple short length pieces without constant attention of an operator.
	10" x 10"	No. 9A	
HACK SAW Dual Bar Feed	10" x 10"	No. 9A3	The No. 9A3 machine combines full automatic operation and manually controlled power bar feed, the latter for lengths beyond practicability of full automatic operation.
HACK SAW Hydraulic Roll Stroke Single Cut	18" x 18"	No. 18	These big saws are proof that the hack saw method is the most practical for cutting off big pieces of the toughest steels. Low investment, economical operating and maintenance cost, accuracy and cutting speed make these machines an ideal tool for the steel mill, warehouse and forge shop.
	24" x 24"	No. 24	
HACK SAW Power Work Handling Type	18" x 18"	No. 18B	The No. 18-B is a special structural saw, primarily designed to obtain accuracy to such a degree in cutting structural shapes that subsequent face milling is not required.

GENERAL PURPOSE HACK SAWS



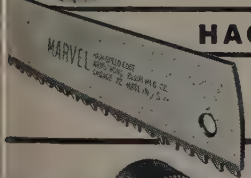
TYPE	CAPACITY	MODEL	
HACK SAW Single Cut	6" x 6"	No. 4B	This saw is fast, accurate, yet moderately priced. For intermittent service, to cut off all types and shapes of machineable metal. Recommended for use in the tool room, maintenance department, and machine shop.
HACK SAW Single Dry Cut	4" x 4"	No. 1	The most popular mechanical saws on the market for occasional cut-off work. Sturdily built, easy to operate, low in price, they are ideal for the small shop where speed is not essential.
	6" x 6"	No. 2	

UNIVERSAL BAND SAW



TYPE	CAPACITY	MODEL	
BAND SAW	18" x 18"	No. 8	The MARVEL No. 8 Band Saw is designed primarily for universal work. It will trim, miter, notch and cut-off bar stock, pipe, structural sections, mouldings and tubing. No other saw of any type is capable of handling the wide range of unusual cutting jobs possible on this very versatile machine.

HACK SAW BLADES—*High-Speed-Edge*



COMPOSITE UNBREAKABLE

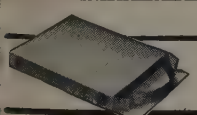
The original composite blade with a fast-cutting, long-lasting high speed steel cutting edge integrally welded to a tough, non-breakable alloy steel body. These superior blades improve the efficiency of ANY hack saw machine because they will withstand heavier feed pressure, higher tension, and faster speeds. A type and size for every hack saw, for every machineable material.

HOLE SAWS—*High-Speed-Edge*

HEAVY DUTY FOR MACHINE TOOLS

Permit sawing-out of large holes (to 4½" dia.) in steel plate (to 1⅛" thickness) with small capacity machine tools and portable tools. Heavy duty arbors and 1-piece floating, self-aligning, High-Speed-Edge saws. This new type hole saw, developed by MARVEL, provides a fast, low-cost method for making large holes, an operation previously requiring much machining or large equipment.

BAND SAW BLADES



WELDED TO SIZE INDIVIDUALLY PACKAGED

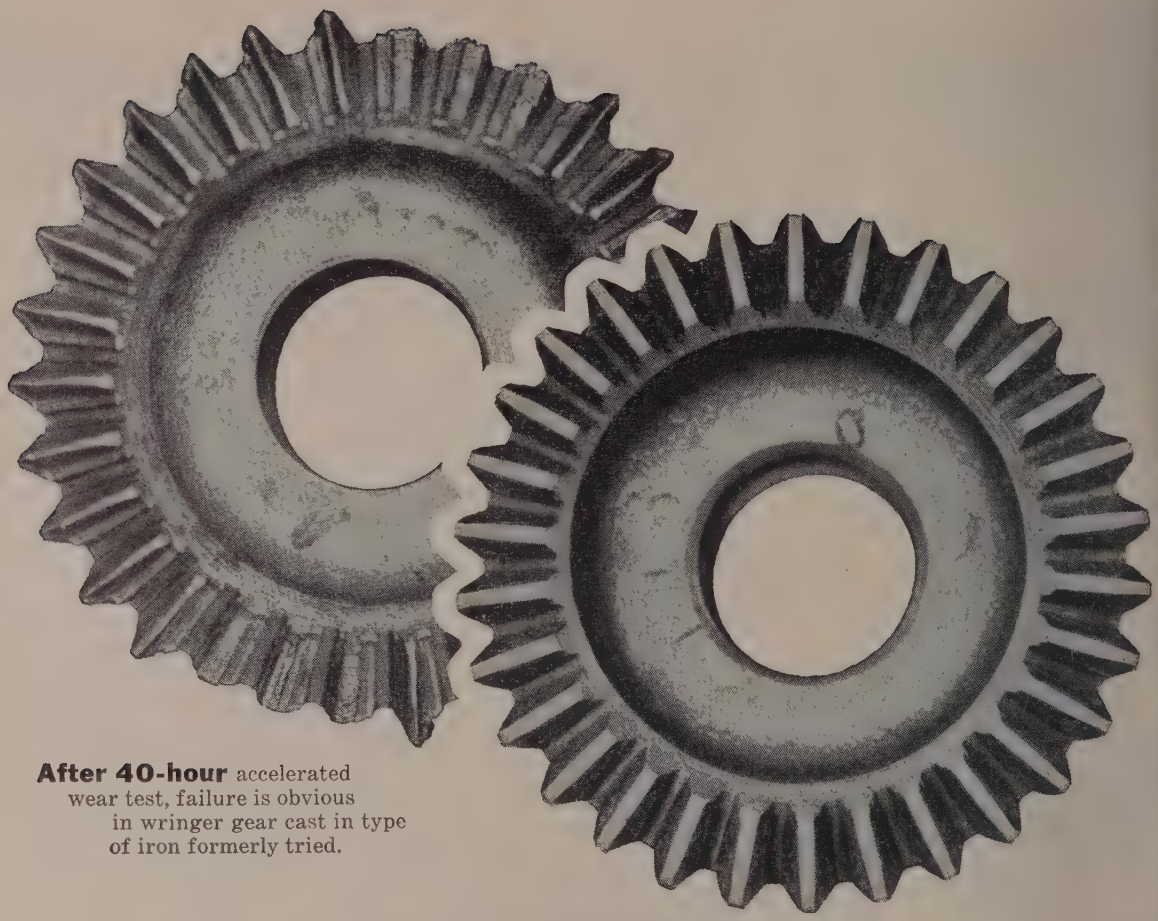
Through exhaustive tests MARVEL has determined the type of set—raker or wavy—best suited for all-around cutting on every standard make and model metal band saw. These exactly suited blades come welded to size, ready for use, and individually packaged.

Write for Catalog

ARMSTRONG-BLUM MFG. CO.

5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

MARVEL *Metal Cutting* SAWS



After 40-hour accelerated wear test, failure is obvious in wringer gear cast in type of iron formerly tried.

After 256 hours of identical testing, this Ductile Cast Iron gear shows distinctly superior resistance to wear.

Over 500,000 gears prove you can minimize rejects with Ductile Cast Iron

USERS AND PRODUCERS ALIKE gain basic advantages from Ductile Cast Iron.

Here's a typical example, a wringer gear cast in Ductile Iron for washing machines made by The Maytag Company of Newton, Iowa. More than 500,000 such gears now in service attest to two facts: satisfactory response to fabrication, and satisfactory performance for users.

Wringer gears must defeat wear to extend gear life. Test and performance records show how fully Ductile Iron gears meet this need.

But despite high wear-resistance, Ductile Iron is machinable. Indications of improved tool life and finish add to the fabricator's satisfaction with this versatile iron.

In the foundry . . . rejections have been almost zero.

"Castability" of Ductile Iron spells volume output in St. Paul Foundry & Manufacturing Company, St. Paul, Minn., and in Jamestown Malleable Iron Company, Jamestown, N. Y., producers of wringer gear castings for Maytag home washing machines.

Try Ductile Cast Iron. Learn first-hand, how it outperforms other materials under tests and in service. Write now for a copy of the new booklet entitled, "DUCTILE IRON, THE CAST IRON THAT CAN BE BENT."

It's yours for the asking. We'll also send you the latest list of authorized foundries now producing Ductile Cast Iron under patent licenses. Write to INCO now.

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N.Y.

Selling in '56

So many changes are taking place in the economic fabric of our country that we are forgetting some of the finer points in the art of selling industrial products.

Economists and market researchers in the consumer field point to the projected growth in population (from 168 million in 1956 to 200 million or more in 1970).

They explain what population means in terms of expanded steel and metal requirements, added plant capacity, construction of new homes, sales of appliances and the need for an extra car as more families shift from city to suburban living.

In this pleasant aura of population growth and expanding markets, many people are unaware of the continuing battle being waged among the materials, equipment, processes and components that make products for the consumers possible.

The competition is nip and tuck. Too often emphasis is on getting the immediate order at a given price, without regard for future sales.

What selling really takes, says John Graham, chief metallurgist of the International Harvester Co., is a combination of clairvoyance, psychology and diplomacy. (He spoke last week before the Industrial Heating Equipment Association.)

The seller must figure out where to center his attention and get the information to the people who need it, without injuring the feelings of others. The plant engineer needs the information because he's in charge of equipment. The plant metallurgist needs it because he's responsible for the quality of the product. The buyer in the purchasing department needs it because he has the job of seeing that the right equipment is bought.

After the sale is made, the job is not done. Says Mr. Graham: "When you put in new equipment, you are setting the stage for your company for years to come. Make it work right. If it's not up to standard, it's a constant reminder. Tell us how to set up a program of preventive maintenance, so we can avoid the pitfalls that lead to breakdowns."

The problems of selling are becoming increasingly complex. Merely asking for the order, the application of pressure and influence and price cutting are not the answer.

It takes a good product and the complete understanding of the underlying needs of your customers.

Irwin H. Such

EDITOR-IN-CHIEF

THE ICEMAN GOETH...

Ever stop to reflect on how American traditions are being quietly but constantly removed from the scene by progress? The iceman, for instance. In our day, the development of modern refrigerators and more than a hundred other household appliances has made life a great deal more pleasant. A vigorous and imaginative appliance industry has emancipated us from household drudgery.

New and better steels have played their part in this evolutionary process. And here at Inland, we've been pleased to work closely with appliance manufacturers, over the years, to provide the *right* steels for their products.

INLAND STEEL COMPANY *38 South Dearborn Street, Chicago 3, Illinois*
Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York • Steel products supplied to the appliance industry include hot and cold rolled sheets and strip, enameling iron sheets, electrical sheets, Ti-Co galvanized sheets, tin plate, black plate, bars. Other products: plates, structurals, 4-Way safety plate, reinforcing bars, rails and track accessories, coal chemicals.

Steel Shipping Costs May Climb*
5- 90 miles ..... 20 cents a ton more
90-230 miles ..... 40 cents a ton more
230-400 miles ..... 60 cents a ton more
400-535 miles ..... 80 cents a ton more
*Proposed new rates for central territory on common mill products in 40,000-lb lots

Pittsburgh Steel Co.

Freight Rates: Headed Up?

RAIL FREIGHT rates may be hiked 7 per cent effective Feb. 25. Here's what the increase would mean in terms of bar, sheet and other common steel mill products:

From Cleveland to Detroit, today's charge is $6 a ton; the new cost would be $6.40. From Buffalo to Albany, N. Y., the cost is $8.80 a ton; it would be $9.40. From Chicago to Milwaukee, cost is $4 against $4.20. These rates are figured for 40,000-lb lots. For the mileage schedule, see chart above.

Precedent? — Railroads claim every day lost in making the new rates official costs them $1.5 million. Since last September, their overhead has moved up fast. Normally, it takes as long as a year for them to put an increase through the Interstate Commerce Commission. Speeded up procedure provides less than a month for hearings before the increase is allowed.

After that, ICC may continue hearings. If it should later decide to alter any of the terms of the increase, railroads have agreed to refund extra freight charges to customers.

Backing—Steel producers favor the increase, says C. W. Gottschalk, vice president, traffic, Jones & Laughlin Steel Corp., Pittsburgh. Reason: "Unless we have healthy railroads, car shortages will continue. High-level production is no good if you can't ship your output. The roads are trying to do something about last year's freight car shortage; we should support them."

No disruption of steel marketing patterns is foreseen, since the increase is to be nationwide. But marginal market areas will be harder to sell.

Pros and Cons — Steel users aren't so unanimous. Machine tools are shipped f.o.b. mill. A typical comment: "Our lathes cost $25,000. It won't make any difference to the customer whether freight is $100 or $107." C. A. Baldwin, vice president, Globe Steel Barrel Co., Cleveland, disagrees: "Freight represents too much of the cost of the product for us to absorb any such increase. It will be a further incentive to users to switch to used drums. Used drum people usually serve a local market."

For some, the freight increase is sidetracked by matters more urgent. Many gray iron foundrymen, for instance, are too concerned about scrap to have given much thought to the implications of the freight hike.

Dissent — Says L. E. Galaspie, traffic manager for Reynolds Metals Co., Richmond, Va., "It is not good for the ICC to rubberstamp a proposal of this kind. Small shippers which may be adversely affected won't have enough time to develop evidence on the effects of the increase on their markets. The offer to refund won't help manufacturers that lose markets because customers are forced to look nearer home for suppliers."

Reynolds intends to absorb the increased costs. But, says Mr. Galaspie: "Like many other companies, we'll be reviewing our freight situation plant by plant. We may well find places where we would be ahead to dispense with the common carriers and put in our own truck fleets."

Spreading — Truck and water carriers won't lose any time in putting their rates in line. Some authorities think that the railroads

might exempt certain industries from the new rates of their own accord. This would handle the problem in coal, now the only large group opposing the increase. Coalmen say freight is more than 40 per cent of the delivered price of coal, and that the proposed increase would "melt $75 million from revenues each year."

But the consensus is that railroad plans will be approved. Says Arthur W. Todd, traffic consultant for Lincoln Electric Co., Cleveland: "We and many other metalworking companies are supporting the measure. We've checked their costs, and 7 per cent is a true reflection of the increase they need." Mr. Todd and other industrymen point out that realistic increases as they're needed are best for all.

Walter J. Campbell

Irwin H. Such

STEEL Promotes Four Editors

Irwin H. Such has been named editor-in-chief of STEEL. Walter J. Campbell, managing editor, succeeded him as editor.

Vance Bell and John Morgan were appointed associate managing editors.

Editor since 1946, Mr. Such has been with The Penton Publishing Co. in various capacities for the last 28 years. Joining the *Daily Metal Trade* editorial staff in 1928, he advanced to associate editor, nonferrous editor and business manager. In 1937, he went to New York as eastern editor for the Penton publications. He returned to Cleveland as editor of *Daily Metal Trade* in 1940 and in 1943 was named engineering editor of STEEL.

Mr. Such is a graduate of Western Reserve University. He is a past president of the Society of Business Magazine Editors.

Mr. Campbell joined this publication in 1937 as associate editor, was named news editor in 1949, managing editor in 1950.

A graduate of Ohio Wesleyan University, he served nine years as reporter and editor on Ohio newspapers before joining Penton.

Mr. Bell trained at Ohio State University's School of Journalism, joined STEEL in 1944, after 11 years with other magazines and newspapers. He became assistant managing editor in 1952.

A Yale graduate, Mr. Morgan joined the magazine in 1947. He was appointed assistant managing editor in 1952.

Scrap Pushes Prices

High scrap quotations are hitting foundries hard, may force casting prices up

FOUNDRYMEN say high scrap costs are pressuring them into another price increase.

Most casting prices rose last year; some foundries raised twice.

A Milwaukee foundryman says: "We raised prices 8 per cent last July, then due to increased metal prices, we had to raise them another 3 per cent this month. Most foundries will have to follow."

A Cleveland foundryman puts it this way: "The foundryman who hasn't raised prices in the last six months probably doesn't know his costs or is operating at a loss."

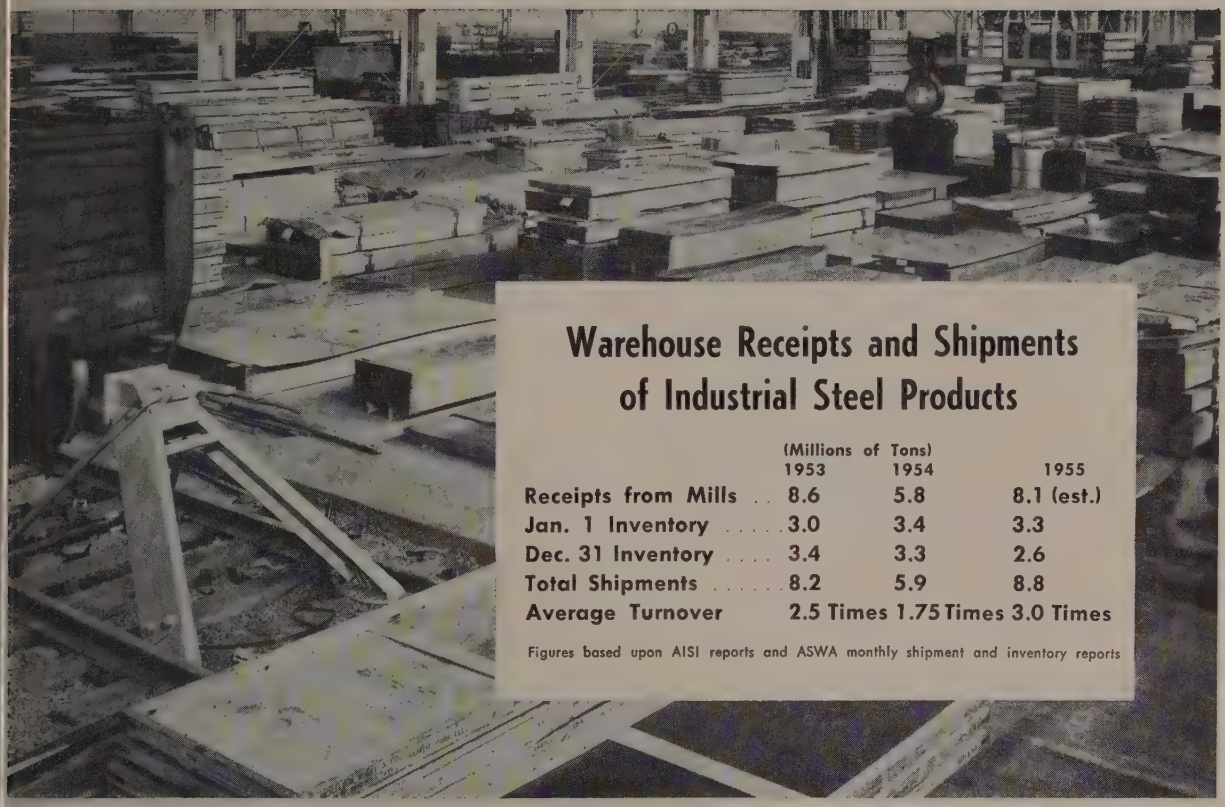
Some may stand pat for a few months. They suspect pig iron will go up and also want to include the cost of labor settlements in the price boost.

Complaints — Few foundrymen say there is a shortage of scrap, although some have seen their scrap prices go up 50 per cent. But they do feel strongly about the exports of scrap which reached a high of 4.4 million gross tons last year. They'd like to see either a limit placed on exports or a stockpile set up for defense needs. To them, scrap is a national resource and needs to be conserved.

Not generally recognized is the foundrymen's dependence on steel scrap. Malleable foundries use about 1 million tons of it a year, steel foundries, 2 million tons.

Gray iron foundries melt about 35 per cent purchased scrap. Charles Walton, Gray Iron Founders Society, estimates that more than half of this is steel scrap. Steel is needed to make higher strength irons.

Possible Improvement—A turning point may have been reached in the scrap market. A survey of the Institute of Scrap Iron & Steel shows the market is leveling off or going lower in almost every area. Lederer Iron & Steel Co., Cleveland, estimates that prices in February will be $4 to $5 a ton lower. This week STEEL's scrap price composite dropped $1.83, (see page 144).



Warehouse Receipts and Shipments of Industrial Steel Products

	(Millions of Tons) 1953	1954	1955
Receipts from Mills	8.6	5.8	8.1 (est.)
Jan. 1 Inventory	3.0	3.4	3.3
Dec. 31 Inventory	3.4	3.3	2.6
Total Shipments	8.2	5.9	8.8
Average Turnover	2.5 Times	1.75 Times	3.0 Times

Figures based upon AISI reports and ASWA monthly shipment and inventory reports

Benjamin Wolff & Co.

Despite auto cutbacks in steel use . . .

Warehousemen Confident

CUTBACKS in automotive steel are not worrying the nation's warehouse operators.

They think steel business in 1956 at mills and warehouses will equal that of 1955. Steel production will not vary much from the record-breaking 117 million tons reported last year.

Meeting—That's the view leading distributors expressed last week in New York at an executive committee meeting of the American Steel Warehouse Association.

They feel that any slack in auto demand will be quickly taken up by other consumers.

Inventory Recoup — For that matter, warehouses themselves will take up some of the slack. They need steel. Last year (see table) they dipped into their inventories to the tune of 700,000 net tons in shipping some 8.8 million tons of industrial products.

The latest survey by the warehouse association shows these district inventory positions in the leading products:

Southern States — One month, carbon plates and structurals (galvanized sheets, Texas); two months, sheets and strip; three months, hot-rolled bars, mechanical tubing, pressure tubing, stainless steel; four months, cold-finished bars, standard alloys; five months, galvanized sheets.

Atlantic States — Under one month, carbon plates, structurals; two months, hot-rolled bars, sheets and strip; four months, galvanized sheets, high tensile steel, stainless steel; five months, cold-finished bars, mechanical tubing, pressure tubing.

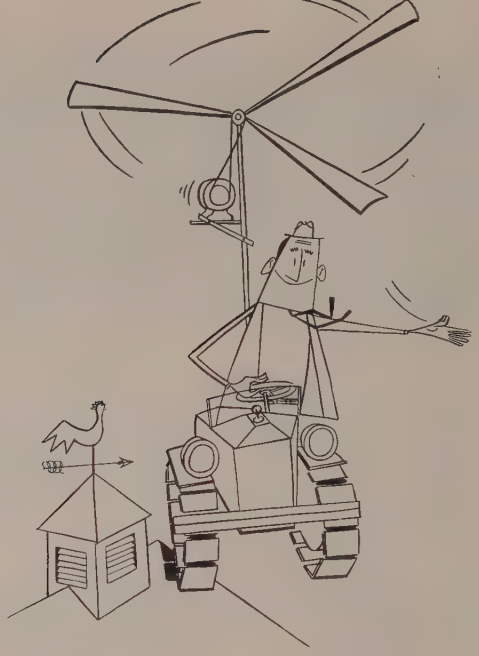
Central States — Under one month, carbon plates and structurals; two months, hot-rolled bars; three months, sheets and strip, galvanized sheets, stainless steel; four months, high tensile steel; five months, cold-finished bars.

Great Lakes Region — One month, carbon plates and structurals; three months, hot-rolled bars, sheets and strip, galvanized sheets, standard alloys, high tensile steel; four months, mechanical tubing, stainless steel; five months, cold-finished bars, pressure tubing, tool steel.

Pacific States — Two months, carbon plates and structurals; three months, sheets and strip; four months, hot-rolled bars, galvanized sheets, pressure tubing, high tensile steel.

Comment—C. L. Hardy, president, Joseph T. Ryerson & Son Inc., Chicago, predicts demand for sheets and strip will be fairly high for the first six months at both mills and warehouses.

Plates, shapes and bars are in shortest supply at the warehouses. L. B. Worthington, president, U. S. Steel Supply Division, U. S. Steel Corp., Chicago, sees little prospect for early improvement.



How do you plan for automated production? To answer this, the Society of Automotive Engineers staged a session in which executives assumed management roles in the mythical Heliotrac Co., which is considering automation as a solution to design and production troubles

Automation: How To Plan It

UNTIL A YEAR or so ago, Heliotrac was king among American builders of hybrid vehicles. Its product: A cross between an automobile, a tractor and a helicopter.

Past—The market was dominated by Heliotrac and one principal competitor, the Tiltawhirl (which "wisely decided to get out of the picture" in 1955). Heliotrac's management ignored staff pleas to redesign and to update production equipment, choosing to "pile up cash."

The policy didn't get the company into serious trouble until a vastly superior, foreign - made "Vamp" took over the market. Heliotrac's sales slid from $325 million in 1953 to $225 million in 1955. Profits plummeted from $28 million to an $800,000 loss in the same period.

Present — Obsolescence of both product and manufacturing equipment are dragging Heliotrac under. Viewed realistically by Carl L. Hecker, sales manager of Heliotrac Co. (he is first vice president of Oliver Corp.), the Heliotrac is 40 per cent underpowered (published figures to the contrary), less versatile, less maneuverable, less attractive and more expensive than the Vamp. The Heliotrac even has an inferior seat. "You ought to ride all day in a Heliotrac."

The real problem, though, is the engine. Project Engineer E. N. Cole (chief engineer, Chevrolet Division, GM) thinks it "wouldn't run if it weren't for the flywheel."

The four-cylinder engine has a long stroke and only two main bearings. "When we go beyond about a 4½-to-1 compression ratio, the deflection in the crank is about a fifteenth of an inch."

The totally inadequate water pump was added after the sales manager "came back from one of those western trips and had to have it right away."

Mr. Cole also feels the carburetor "doesn't belong on this engine."

What To Do?—Mr. Hecker figures a sales potential of up to 450,000 Heliotracs a year if the product can be improved and offered at a competitive price. He wants to sell at $1200, a $300 cut in price.

Management agrees: The job can't be done with present shop equipment. It's fully depreciated and deteriorated—thanks to "management's short-sighted policies."

Automation will be a must to get along with present floor space, buildings and the labor supply (present and future).

One at a Time—Asked about automating the whole shop, Manufacturing Manager L. I. Woolson (president, DeSoto Division, Chrysler Corp.) replies: Each job "has to be analyzed. Automation will apply economically only to high-production runs." He also feels that the degree of automation will "depend on anticipated volume and the length of the production run without extensive changes."

(Six weeks pass. A second meeting is called. How does management propose to get the company off the ropes?)

New Engine—Mr. Cole recommends an air-cooled engine (no more pump problems). It is designed for easy automatic production and will be simple to modify to stay ahead of competition.

The engine will be made of aluminum; fuel injection and supercharging can be added later.

Automate What?—Mr. Woolson tells Executive Vice President A. T. Colwell (vice president, Thompson Products Corp.) that "cylinder heads, crankcases, crankshafts and manifolds" should be automated because of their quantity and the amount of machining they require.

Special-purpose equipment to make these parts will be flexible enough to permit "more than yearly changes" to keep the sales department happy.

Mr. Woolson figures the equipment will pay for itself in three years with manufacturing savings

alone. It will boost production to the level of 450,000 engines a year.

How Much? — Automating the engine plant will cost $45 million, including a new floor with adequate foundations and a chip disposal system.

In addition, Mr. Woolson wants $10 million to convert the foundry to aluminum for some parts and to update casting facilities.

Parts Reserve—It will take from 12 to 14 months to get the equipment in operation. A bank of parts, he feels, will have to be laid up for that period. This will be done despite Mr. Hecker's insistence that inadequate sales are taking care of the "bank."

Make or Buy?—F. E. Farrell, director of purchases, (assistant director, automotive sales, Bendix Aviation Corp.) feels that many common-denominator parts being made in the plant should be bought outside.

The new automatic transmission is an example. The part lends itself to automation, or it could be purchased from XYZ Corp. (a transmission specialist) for about the same cost.

As Delmar Robertson, XYZ's vice president, (vice president of sales, Dana Corp.) points out: "I will be able to take one of our transmissions . . . and adapt it to your application, incorporating some ideas Ed Cole has." The new "Power Package" can be supplied without any capital investment by Heliotrac.

Capital — Mr. Colwell promises that the directors will raise $100 million through a stock sale. A $15-million bank loan will take care of immediate needs.

Until the new Heliotrac can be built, Mr. Cole recommends buying a better carburetor and a new pump which have just come to his attention. He also says: "With a change in the method of rating horsepower, we can give you about 15 hp more to talk about." He also is willing to add a two-tone paint job.

Taking these steps, Heliotrac's management feels it will solve its problems.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Ten Musts for Automation

Taken from the fictional Heliotrac's case, these are the points the experts think must be considered:

Anticipate Volume

Only long-run jobs will be economical to automate. Each job must be analyzed for the length of run it'll make without changes

Design for Production

Products to be automated should be designed or redesigned for maximum efficiency

Design Ahead

Products for automation should anticipate necessary modifications so they can be made without extensive changes in manufacturing

Anticipate Extras

Automation frequently requires the support of chip disposal systems, central coolant systems, new machine foundations, etc.

Calculate Employee Needs

You'll need to upgrade men to run, maintain and repair new equipment. Many of them will have to be trained in your plant

Look for Versatility

Co-ordinate anticipated design changes with versatility in automation equipment. You may be able to double its useful life

Consider Buying Parts

A vendor may be able to supply a common-denominator part for about what it would cost you to make it. You don't have to invest in equipment

Provide for the Interim

A bank of current parts may be needed to meet demand while new equipment is being installed

Consider the Return

Automation should be evaluated on all the above factors, plus the rate of return on the capital investment

Make It Fit

If it's economical to automate only a few jobs, be sure immediate plans will fit into future programs

Lee Silver Service Inc.

Here's what happens to labor and a little firm when a . . .

Small Company Automates

IS AUTOMATION the private preserve of big companies? Here's one answer from a small firm:

"Our growth has paralleled our adoption and development of automation," says Lee Radke, president, Lee Silver Service Inc., Detroit. This zinc die-casting manufacturer has turned to automated cleaning and electroplating to satisfy the growing demand of the auto and appliance industries for chromium and gold-plated zinc diecastings.

Results — Production has increased ten times in two years (current rate: 120,000 pieces a day). The number of employees has grown from 50 in the hand electroplating days to 200. Explains Mr. Radke: "In spite of increased mechanization, our business has increased so rapidly that employment has grown steadily. We purchased automatic equipment ahead of our needs, but have made our business grow up to its new capacity."

Products & Customers — The company supplies name plates, door handles, horn rings and button, control panels, etc., to such customers as Oldsmobile, Packard, Chevrolet, Chrysler, Frigidaire, Bendix, Westinghouse, etc.

Mr. Radke explains that automation has done more than increase production. It has licked many of the drawbacks of hand plating—high rejects, rapidly deteriorating hand equipment and wasted plating solutions. The new line is solving personnel problems, too. Lifting and transferring plating racks from one solution to another in the heat and humidity was drudgery. It was difficult to keep a competent crew at full strength—almost impossible to find apprentices when jobs were plentiful in other industries.

Lee's automatic plating equipment calls for two inspectors, one loader, one relief man, two machine operators, two men at the preclean operation, one maintenance man and one chemist.

Thumbnail Sketch—Diecastings are placed on the plating racks by hand. Each rack is designed to accommodate a specific zinc diecasting. After a thorough precleaning, each rack is inspected before being conveyed to the electroplating line. The racks are transferred by hand to the plating line.

Designed by Udylite Corp., the equipment permits continuous production and exact timing of each rack as it passes through the electroplating cycle. There are 21 steps for copper-nickel-chromium plate and 20 for copper-nickel-gold plate.

The length of each tank controls the time for the various steps (warm rinse and spray, acid dip, copper strike, nickel plate, etc.). The production rate is 100 racks an hour, or about one rack every 36 seconds.

Future—Lee's automatic plating facilities are just the beginning. More modernization and automation are becoming the order of the day. The most recent addition: A specially designed buffing and polishing section to prepare zinc diecastings for final cleaning and plating steps.

Says Mr. Radke: "We are by no means satisfied. We are constantly looking for further automation and increased production. We realize that only in this way can we keep on lowering unit costs, and successfully meet the demands of our customers."

Teamwork in Truckbuilding

Truck chassis and body builders join forces to keep trucks and busses rolling. Sales of the body builders (about 2000 companies) run as high as $300 million a year

MAYER-POLLOCK CO., known around Pottstown, Pa., as a steel warehousing and fabricating company, has a new product. It's making a special body for a chassis by White Motor Co., Cleveland.

Explains William Pollock, president: "Using a standard flatbed truck, we often damaged fenders and cabs while loading large structurals. We couldn't handle long beams safely, because they blocked the driver in his cab. Our new body gives better load distribution; we can haul long beams without a trailer. And because of the short wheelbase, we get better maneuverability in traffic."

Anomaly?—White and other independent truck builders, like Mack Motor Truck Corp., New York, Reo Motors Inc., Lansing, Mich., and the Motor Truck Division of International Harvester Co., Chicago, build few of their own bodies. They're passing up a sizable hunk of business. (Truck & Body Equipment Builders Inc., Washington, estimates sales of the 2000 U. S. body builders at $250 to $300 million a year.)

But there's good reason. To sidestep competition from the auto giants, independent truck builders concentrate heavily on the bigger trucks. Needs as specialized as Mr. Pollock's are commonplace. Each sale becomes a problem in custom tailoring. International Harvester's operation is typical. It builds its own standard bodies —some 7000 delivery and 40,000 pickups a year. Its remaining output goes through the body men.

Partners — Reo does business with about 15 truck body makers. Duplex Division of Warner & Swasey Co., Lansing, Mich., has three sources of bodies for its dump trucks. It usually assembles body to chassis in its own plant. Mack makes trucks, school and transit busses. "We build only our own transit bus bodies," comments L. E. Minkel, vice president, "and they're integral with the chassis."

Says R. D. O'Brien, vice president, Kenworth Motor Truck Co., Seattle: "Some body builder salesmen work closely with our sales force on interchange of prospects." But he adds: "This is not a major factor of our business." Boyertown Auto Body Works Inc., Boyertown, Pa., is one body builder that handles sales through franchised chassis dealers. Many of the others have their own distributors, most maintain independent salesmen.

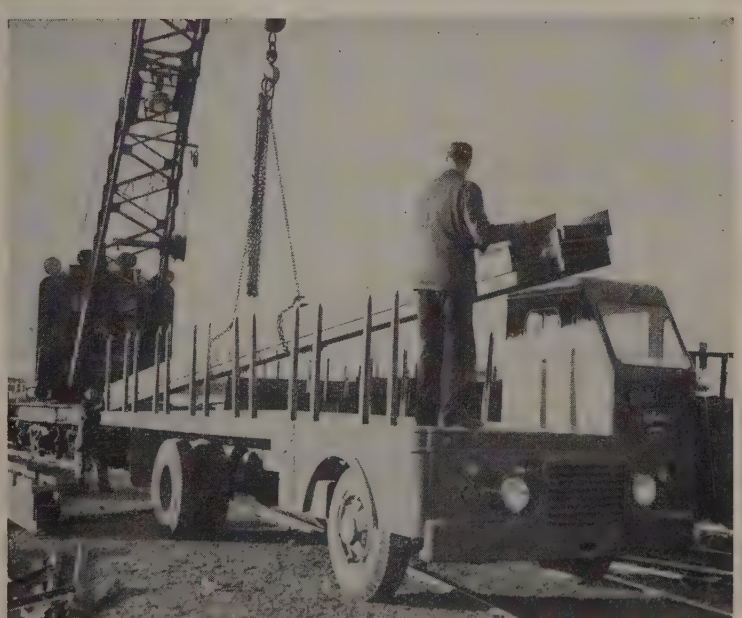
Chassis and body builders work closely on electrical wiring and other engineering standards. And since body builders are on the firing line, they serve as a sensitive barometer of customer preference for the chassis builders.

Payoff—Right now, Mayer-Pollock and White are ironing out the final details of Bill Pollock's truck. Though the body is designed to retain all features of the White chassis, minor changes must be made in the engine and other details. Both White and Mayer-Pollock are anxious to get the trucks on the market. Bethlehem Steel Co. and Jones & Laughlin Steel Corp. are interested. Co-operation between White and Mayer-Pollock is one more example of how specialists keep trucks and busses rolling.

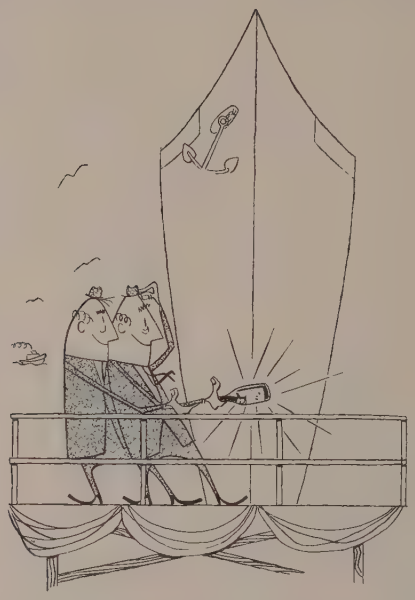
More Automation Maintenance

How to meet maintenance and engineering problems in the automation age was the subject of the seventh Plant Maintenance and Engineering Show, Jan. 23-26, Philadelphia. Some 20,000 visitors attended 43 conferences and saw 10,000 pieces of industrial equipment exhibited by 372 companies.

R. I. Ruel, industrial engineer, Food Machinery & Chemical Corp., reported: "Maintenance employees outnumber production workers in many industries now, and with the current trend toward automation, this shift can be expected to accelerate."



Bill Pollock's special body on the White 3016 chassis. Body is of high tensile, lightweight steel to give maximum loading. The design retains such standard White features as the tilting cab for motor accessibility



Agreement between Grace Lines and Maritime Board brings . . .

Work for the Shipyards

A LONG RANGE shipbuilding program with immediate benefits is underway. Grace Line Inc. is undertaking a $286-million ship replacement program as one of the conditions of a new 20-year operating-differential subsidy contract with the Federal Maritime Commission.

Construction will start immediately on two passenger-cargo liners costing about $23 million each. Newport News Shipbuilding & Dry Dock Co. will do the building. Its bid called for completion of the first new liner in 830 days.

A Specter—The Grace Maritime Board contract calls for replacement of the 24 remaining Grace Line Ships (freighters and combination cargo-passenger ships) over the 20-year period.

Clarence G. Morse, Maritime Board chairman, hailed the contract for its beneficial effect on the merchant marine and shipyards and for the way it meets "the specter of block obsolescence that has plagued postwar planning in the maritime industry."

Perils of the Pentagon

It's possible that red tape may bog down full utilization of the Defense department's new reserve tool and facilities policy (STEEL, Jan. 16, p. 39). One part of the policy calls for an emergency reserve fund under Defense administration to meet emergency production needs. Some of the military point to the way former machine tool layaway programs (administered by the department) dragged on and on.

They fear the same trouble may develop with the new setup, so they may plan to rely on their own contingency funds to meet emergencies.

Manpower Conservation

To conserve the supply of skilled manpower, Office of Defense Mobilization says men with critical civilian skills will be eligible to complete active military duty in three to six months, serve the balance of their military obligation in the Ready Reserve.

Ordinarily, they would have to serve two years of active duty, plus Reserve time. Included are: tool & die makers; tool & die designers; patternmakers; diesetters; jig & template makers; professional engineers; graduate-level chemists, mathematicians and physicists.

Apprentices are not eligible. Aircraft and engine mechanics, electronics technicians, instrument repairmen and machinists are not on the list either, because they are in short supply in the Armed Forces.

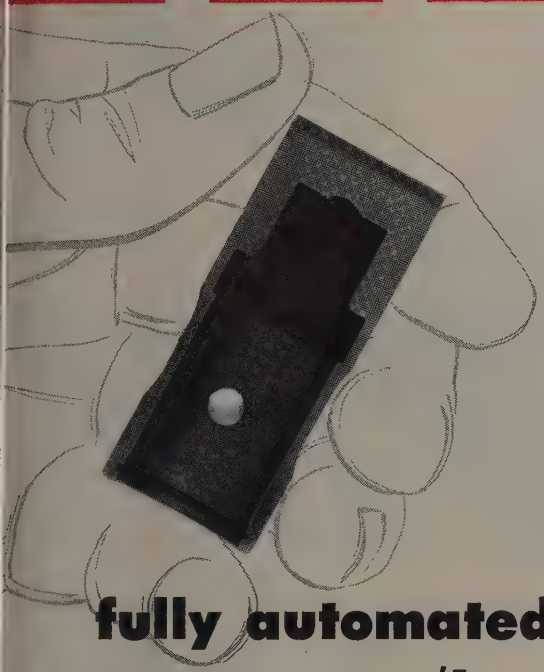
Stand-In Wanted for Mica

Facilities to develop and produce substitutes for muscovite block and film mica will be considered for fast tax write-off. Always in short supply in the U. S., mica is essential in electronic components like tubes and capacitors.

The Office of Defense Mobilization has set an expansion goal to produce enough synthetic mica or other materials annually to replace 2 million lb of natural mica. Applications for certificates of necessity must be submitted to ODM before June 30.

Here and There

The Defense department asks Congress for a public works authorization of over $2012 million. A little more than half the construction ($1055 million) will be in the U. S. The total includes $79.8 million to house military personnel and dependents . . . Fifty-nine more firms are eligible, after security clearance, to use restricted Atomic Energy Data to develop civilian atomic projects. Through the end of 1955, 602 access permits have been issued to encourage growth of a civilian atomic industry . . . House Appropriations Committee vetoes Defense department plans to close Navy chain and rope plants in Boston, paint shops at Norfolk, Va., and Mare Island, Calif.

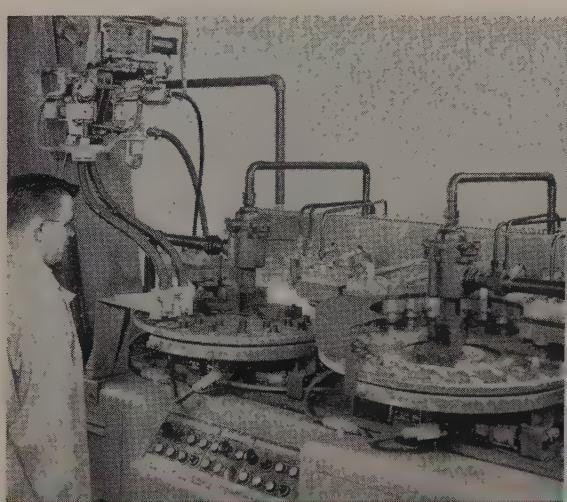


fully automated flamatic hardens 3600 parts/hour continuously

3600 hydraulic valve lifters per hour are continuously conveyed from a hopper to "carousel" type fixtures on this Cincinnati Flamatic hardening machine. The carousels index automatically after each heating cycle to bring a new pair of parts into position. Each lifter is selectively hardened to RC 57-61, to a 3/32" depth, and dropped into the oil quench. This is another demonstration that Cincinnati Flamatic engineers can match unusually high production rates and tight heating specifications by combining standard components with ingenious tooling.

Control cabinet, quench tank, and conveyor are standard; hopper-fed loading mechanism, turntables, and flame heads are special.

Look into Flamatic-hardening as a new approach to your heat treating problems. Send for Bulletin 1861-M.



CINCINNATI flamatic

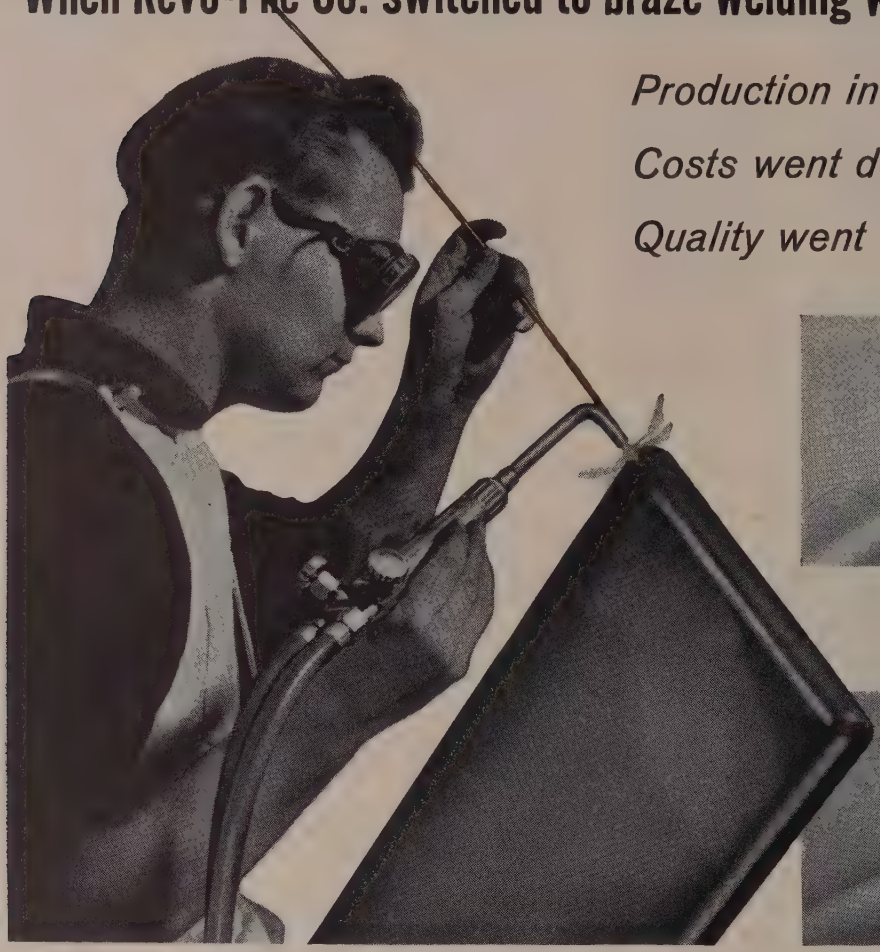
PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

When Revo-File Co. switched to braze welding with Anaconda Ro

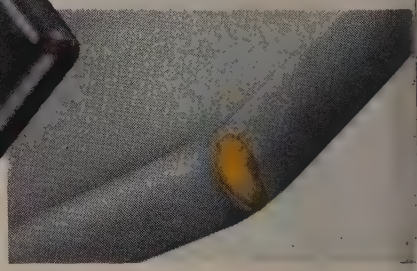
Production increased

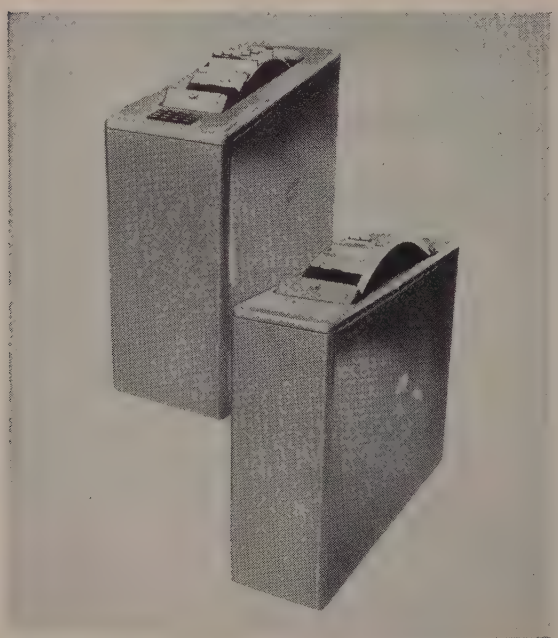
Costs went down

Quality went up



Close-up of braze weld in par corner. Panels are #18 gage mi steel. **Below:** A corner after sandi — the basis for a smooth, perfe enamel finish.





Revo-Files, marketed by the Mosler Safe Company. Unit at left is electrically operated — a touch on a button brings desired section of revolving file into place. Right-hand unit is manually operated. Corners of top and two end panels, plus seams on the locking covers, are braze-welded.

14 superior braze welds in 7 minutes

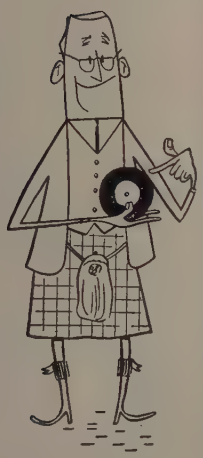
The Revo-File Company of Freeport, L. I., used to arc-wel panel corners and locking-cover seams on its revolving-file cab nets. But they were troubled by lack of penetration and by cor siderable porosity.

About six years ago, the Company turned to oxyacetyler braze welding, using Anaconda-997 (Low Fuming) Bronze Roc They found that the rod flows smoothly, is easy to control — reduc ing the time required to make the welds. It takes only 7 minute to complete 14 welds, an average of 30 seconds per weld.

In addition, the welds are uniformly sound and well-formed reducing finishing time. Thus, for Revo-File Company, the switc meant better product quality, lower costs, and increased productior

Anaconda-997 (Low Fuming) Bronze is a superior weldin rod used to join gray and malleable cast iron, steel, and coppe alloys by the oxyacetylene process. It is one of a broad line o Anaconda Welding Rods that are finding increasing application in production and repair welding. Anaconda Welding Rods ar sold by distributors of welding equipment everywhere. Whitehea Metal Products Co. of New York furnish Revo-File Co. with Anaconda rods. See your Anaconda distributor or write: The American Brass Company, Waterbury 20, Connecticut. In Can ada: Anaconda American Brass Ltd., New Toronto, Ont. 5512

ANACONDA® WELDING RODS



Norton's Lawson: Canny Salesman

ROBERT D. LAWSON ARRIVED in the U.S. from Scotland when he was ten years old. After graduating from grammar school at 14, he joined Norton Co. as an office boy for the engineering department. His title today: Vice president and sales manager of Norton's Grinding Machine Division.

Future—"Our sales now and in the years to come will be more dependent on custom-engineered tools—not a standard line of products," says Mr. Lawson. Each customer has his own specifications when it comes to placing an order for automatic grinding equipment.

The transition from semiautomatic to automatic grinding units has been gradual because of numerous technical problems. Mr. Lawson singles out two of the most important: 1. As a wheel wears, its surface speed is reduced, changing its cutting action. 2. Truing loses its precision as the diamond used for this operation wears. No. 1 has been solved by variable speed drives which provide a constant peripheral speed. No. 2 has been resolved by wheel and diamond wear-compensating mechanisms, including post gaging and feed-back equipment.

Sell, Sell—The grinding division's sales organization, explains Mr. Lawson, consists of distributors who are supplemented by district sales engineers and managers and resident demonstrators. "This," he says, "gives us a stable sales organization. The distributor can hire more men during peak periods, and during a slack year, he (the distributor) has a more diversified line to keep salesmen busy." Another advantage: This method allows every Norton salesman to: 1. Concentrate on closing orders. 2. Service established customers. The distributor has the responsibility of digging up prospects.

Foreign Outlook—While standard-type machine tools face an uphill battle in foreign markets, automatic equipment is getting a better reception. Mr. Lawson points out that automatic piston, camshaft and crankshaft grinding equipment is finding new markets abroad.

Turning to the domestic problem of the current shortage of young engineers, Mr. Lawson emphasizes that too many graduate engineers are entering sales. In many instances, he feels, an engineer is being given the nod for a position which could be filled adequately by a technically inclined liberal arts or business graduate. "We try to determine if an engineer is a must for a specific sales job," he says.

Mr. Lawson's hobby, reading, has helped him acquire a storehouse of knowledge—and higher education. Early in his career with Norton he attended several college-level courses.

Superior Spinning & Stamping Co.

Skilled workers and new machines boost spinning

Metal Spinning Sales Whirl

THE CHANGE from art to science is bringing more business to metal spinners. G. E. McCulloch, vice president, Metal Spinners Inc., Milwaukee, estimates that yearly sales of the industry have approached or exceeded $100 million.

The Industry—Small shops predominate. George F. Farley, vice president, Spincraft Inc., Milwaukee, estimates that there are 50 or more job spinning shops with five or more workers and over 1000 smaller shops. In all, there are about 1800 shops.

Haag Machine Co. Inc., Hawthorne, N. J., maker of metal spinning lathes, has about 1200 names on its prospect list. It finds that many shops not listed spin their own products.

Reports—Haag produced almost four times as many spinning lathes in 1955 as in 1954. Cincinnati Milling Machine Co. found first interest in its Hydrospin was shown by aircraft firms; now job shops and automotive suppliers are interested in its specialized forming process.

Metal Spinners Inc.'s sales were up 25 per cent in 1955. It expects the same increase this year.

Last year was the best in C. A. Dahlin Co.'s history. The Chicago firm's sales were up 18.6 per cent over 1954's. C. A. Dahlin, president, calls the 1956 outlook good, notes backlogs run up to three months.

Better Mousetrap — Keeping abreast of the sales push are improvements in metal spinning. Long an art, new machine and metallurgical improvements have brought accuracy to the process.

Mr. Dahlin asserts: "We're holding tolerances to 1 and 2 thousandths."

Metal Spinners Inc. says heavier gage, larger diameter and deeper parts can be made. One machine will spin ¼-in. steel up to 132-in. in diameter without heat. Thicker metal can be spun because hydraulic controls relieve the operator of much of the labor.

An advantage of Lodge & Shipley's Floturn process is that cold flowing reveals flaws. Inspection is not needed.

Products — Applications range from atom smashing equipment to chicken brooders, from Christmas tree holders to television tube shells. Biggest users are in the aircraft, food machinery, air conditioning, electrical equipment and laundry and dry cleaning fields.

The low cost of tooling and the short time needed for setup make spinning a natural for pilot models and short production runs. For jobs running more than 5000 pieces, spinning generally is not competitive unless the part is conical and can be made on the automatic lathe. On some jobs costs are cut by combining with the deep draw process.

A Shortage—Labor is the big problem. G. E. Lober, Superior Spinning & Stamping Co., Toledo, O., says younger workers have "not accepted the long apprentice program and training needed to become well-paid journeyman spinners." It takes from five to ten years to learn the trade; most companies find they must train their spinners.

Carrier Sees Hot Future

The necessity to boost production efficiency in a highly competitive economy will make the air conditioning of industrial plants "inevitable," says Charles V. Fenn, vice president of Carrier Corp.'s Machinery & Systems Division. He cited two nationally known manufacturers that have experienced lower absenteeism rates and increased production line efficiency since installing air conditioning.

Estimating a $600-million vol-

me of large air conditioning and efrigeration installations in 1956, r. Fenn predicted an $850-million arket by 1960.

Vanted: Atomic Industry

The AEC wants industry to ake over the recovery of uranium rom uranium-magnesium fluoride crap. It proposes to sell the crap to industry on the basis of ranium content, then repurchase cceptable recovered uranium.

Commercially usable fluorine ould also be salvaged from the 000 to 8000 tons of scrap ex- ected to be available annually. Jp to 300 lb of scrap will be fur- ished free to firms wanting to in- estigate.

DM Grants Tax Write-Offs

Certificates of necessity for ac- elerated tax amortization total- ng $140,832,513 were issued by he Office of Defense Mobilization he second two weeks of December.

Metalworking projects certified n the amount of $1 million or nore were: Butte Pipe Line Co., Houston, Tex., (oil pipe line and torage facilities); International Business Machines Corp., Oswego, N. Y., (components for military aircraft); and Chicago & North Western Railway Co., Chicago, railroad freight cars).

Navy Lends a Hand

The Navy is extending to Cali- fornia, Nevada and Oregon its program for making maximum use of industrial plants in flood disaster areas. (More than $435 million in contracts were let in flood areas in the final four months of last year.)

The program includes: Setting aside portions of Navy procure- ment for negotiation on a com- petitive basis in flood disaster areas; use of government-owned machine tools; extension of con- tract delivery dates; asking prime contractors to consider placing subcontracts with striken firms; expediting scarce materials to con- tractors; co-ordinating informa- tion on possible business that could be brought to the flood areas and the firms there which could do it.

Air Reduction Sales Co.'s trailer brings oxygen to the job

End of the El

CUTTING TORCHES are bring- ing light, space and air along 7 miles of Third avenue in New York City and sending 40,000 tons of scrap to the steel mills.

In August, Lipsett Inc. started tearing down the 78-year-old El, the last of its kind in Manhattan. Early this year the job is to be finished.

How It's Done—Long hoses keep the gas equipment at a safe dis- tance from the line of fire and the "booming" of the steel.

A truck brings acetylene to the demolition site. An eight-cylin- der manifold feeds the gases through 100 ft of hose to a header with six outlets.

Joining in at the header is oxy- gen. It comes from two trailers of the Air Reduction Sales Co. One is used while the other serves as a standby. A portable control panel governs the pressure.

The header sends both oxygen and acetylene through another 150 ft to six oxyacetylene cutters.

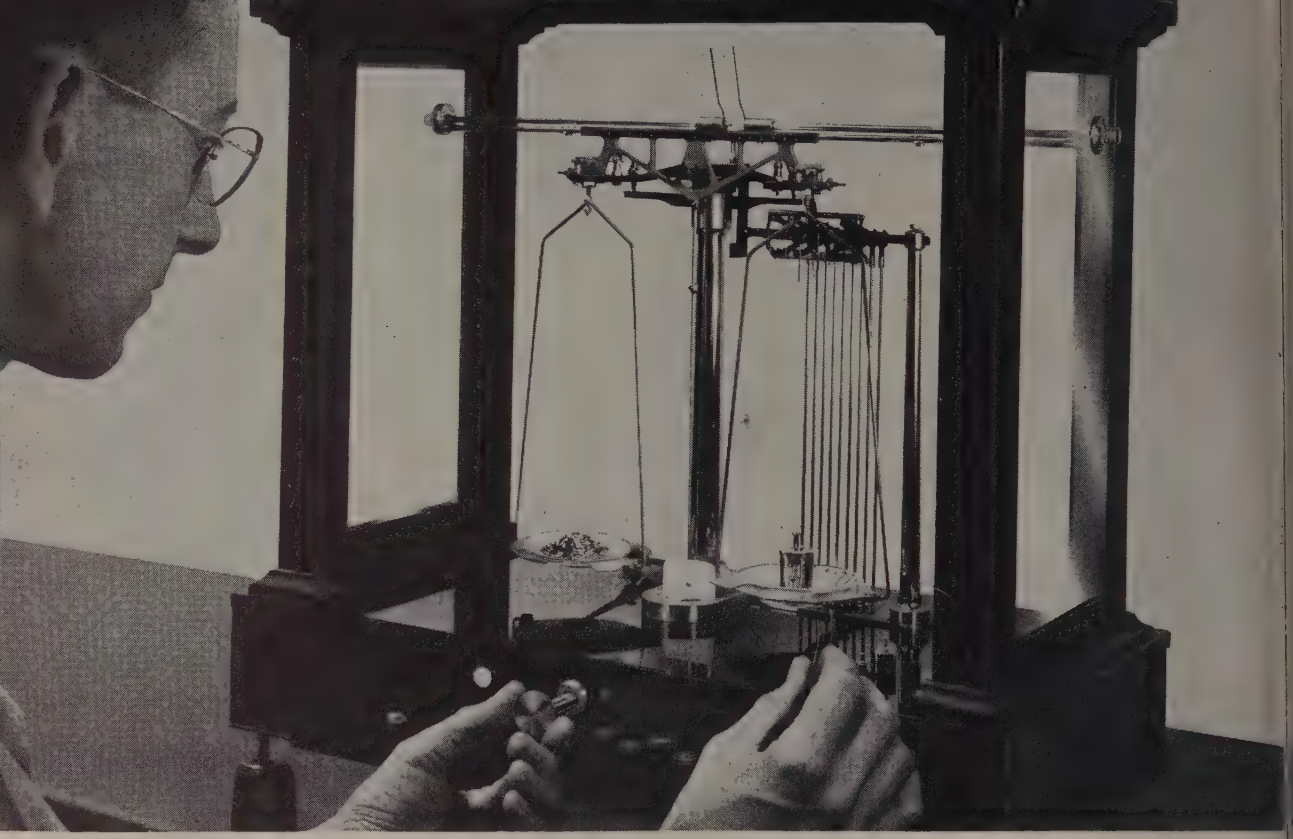
The oxyacetylene flames slice the El into sections 35 ft long. Each one weighs about 35 tons. They are lowered to the ground by a crane.

A Trip—After the sections are dropped to the street, they are loaded on a trailer truck and hauled to Lipsett's scrap yard at the Harlem river.

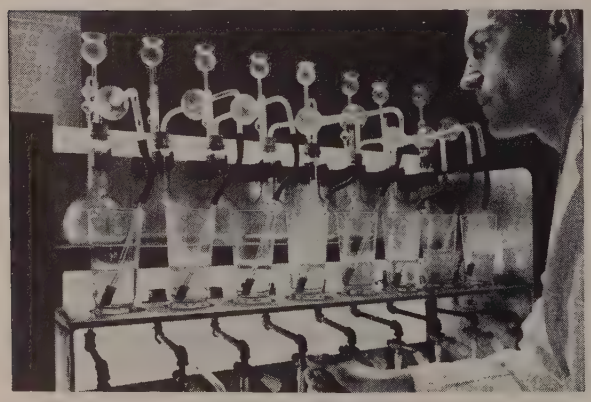
There the El sections are cut by hand. Most of the oxygen used at the yard comes from Airco's largest trailer. Its capacity is 45,- 000 cu ft. A replacement trailer prevents tie-ups.

At the yard, as at the El, there is an extensive use of hose con- nections from the bulk gas sup- plies to the headers for relay to the flamecutters. That gives maxi- mum mobility with a minimum of equipment handling.

The cut-up sections are loaded on barges for the trip to the steel mill.



How Great Lakes Steel *weighs* quality



IN A QUALITY CONTROL LABORATORY, chemical analyses such as these, are run on every heat. Then . . .

THE ANALYSES are telautographed immediately to the melter so he can add elements to meet customer's requirements.

How much does quality weigh? In the photograp above, a test sample is being weighed for chemic determinations. Tests like this give our open-heart operators a running check on molten steel while it still in the furnace; enable them to pour heat aft heat of high and uniform quality.

In every department at Great Lakes Steel, from ra material docks to delivery of finished steel, the en phasis is on quality—on seeing that customers receiv steel that meets their particular requirements.

Do you have a manufacturing problem involving fla rolled steel? A call to Great Lakes will make availab to you the experience of our entire organization.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

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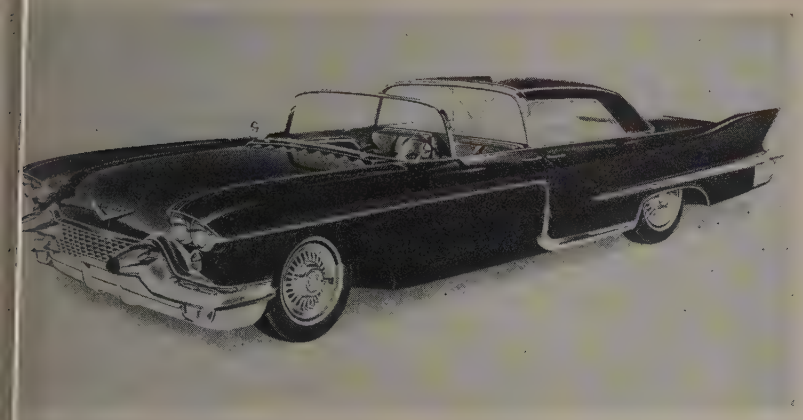
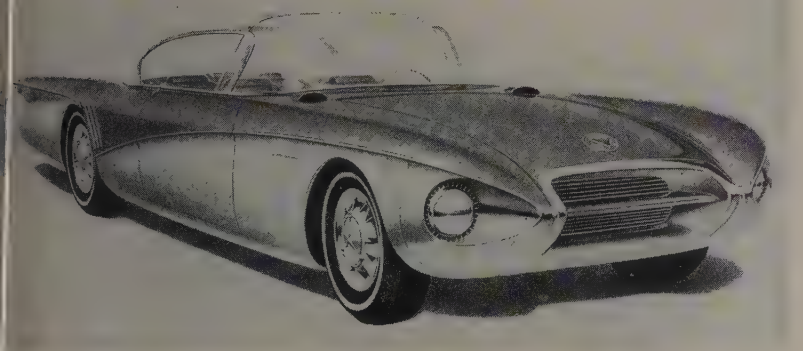
District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



adillac Eldorado Brougham Town Car



uick Centurion may hint at tomorrow's body styles

GM Displays "Dream Cars"

Experimental cars give public a chance to tell designers what they want in future; emphasis today is on safety, low silhouettes and speed

GENERAL MOTORS is winding up the current rash of dream car previews with its Motorama.

Styled around GM's Firebird II turbine engine with a titanium body), the show stresses safety, sports and a continuing interest in fiberglass bodies.

It will be interesting to see what features on this year's crop will turn up on 1957 and 1958 models. The classic example is Cadillac's Eldorado Brougham. Brought out as an experimental job in 1955, it drew such interest that it's scheduled for production this year.

Cadillac Model—Study the 1956 Motorama specialties and you'll see that the Cadillac entry may be the prototype for a 1957 production model. Looking like an exclusive model of the Brougham, Cadillac's Eldorado Brougham Town Car has a more conventional appearance than other experimental automobiles.

Body construction is of fiberglass, with a landau leather top. An electronic safety system automatically locks the doors when the transmission lever is in drive position. The car is 55.8 in. high, 78.8-in. wide. Wheelbase is 129.5-in. and over-all length is 219.9-in. Horsepower isn't revealed, mainly because Cadillac wants to be sure it's on top of the power race. Chances are it will be over 320.

One feature common to the Brougham and Town Car is dual headlights. High and low beams are in separate units. There's a legal problem here. Six states have regulations prohibiting a four-headlight system.

The difficulty may be solved shortly when the Association of Motor Vehicle Administrators meets in Cleveland to see a headlight demonstration. The aim is to have four-headlight systems authorized in all states. Probable outcome: Affirmative.

Buick Centurion—Rumors have it that the Centurion body may be pretty close to what Buick expects to bring out in 1957. But the fiberglass, chrome sweepspear and bucket seats will be omitted.

Horsepower is rated at 325; length is 213.1-in., with a 118-in. wheelbase. Car width is 73.5-in., height, 53.7-in. Rear-end lights have lenses which give a solid chrome appearance when they aren't burning. This gimmick may be seen on next year's cars.

One item on the Centurion which won't be seen, though, is the television camera with a monitor screen replacing the rear view mirror.

Oil and amperage gages on the Centurion are not visible until there is danger. Buick calls this "unique design," but the theory is old. The idea appeared a good ten years ago on Hudsons.

Chevrolet Impala — This two-door, five-pasenger sport sedan is powered by a 225-hp, V-8 engine. It is 53.7-in. high, 74.4-in. wide and 202 in. long, with a 116.5-in. wheelbase. Road clearance is 6 in. The Impala has a panoramic wind-

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U. S. Auto Output

Passenger Only

	1955	1954
January	659,719	456,765
February	675,769	443,257
March	794,188	526,076
April	754,007	533,470
May	724,891	494,250
June	649,372	504,811
July	659,979	441,451
August	614,392	436,650
September	461,592	285,860
October	517,669	236,635
November	748,559	508,466
December	682,698†	641,971
Total	7,942,983†	5,518,662

Week Ended	1955	1954
Dec. 24	150,881	124,854
Dec. 31	105,670	124,250

	1956	1955
Jan. 7	125,245	150,585
Jan. 14	149,995	155,109
Jan. 21	145,889†	161,150
Jan. 28	140,000*	160,666

†Preliminary *Estimated by STEEL
Source: *Ward's Automotive Reports*

shield which sweeps back into the top. This is an item scheduled to appear on at least one '57 car—if not more.

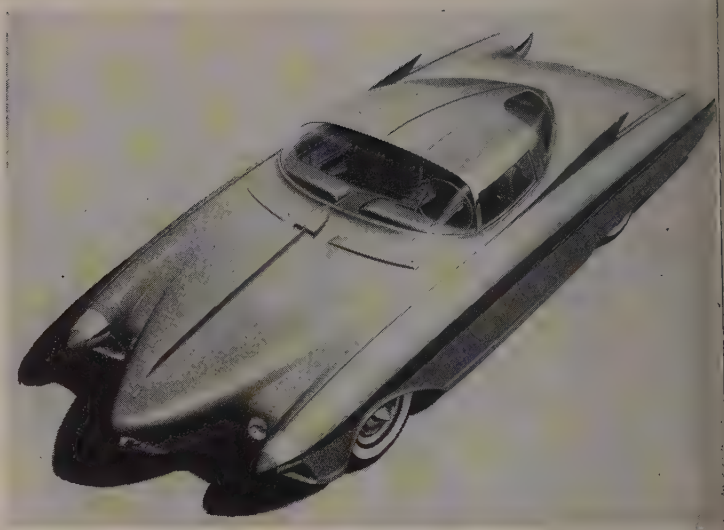
Golden Rocket — Designed by Oldsmobile, the two - passenger sport coupe is 75.4-in. wide, 49.5-in. high and 201.1-in. long. Clearance is 6.5-in. It has a 275-hp engine.

Front bumper guards are of air-filled rubber and project out of the fenders. Another experimental item is the fold-under steering wheel which collapses when two buttons are pushed. This supposedly aids in getting into and out of the car.

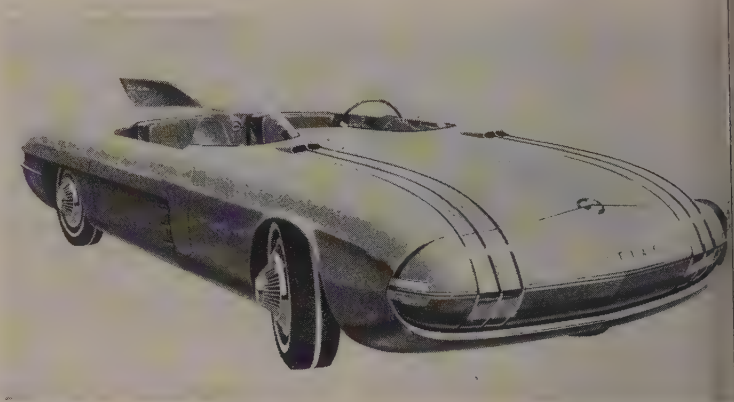
Club de Mer—The Pontiac contribution bears a resemblance to the old Campbell Bluebird racer. It has an anodized, brushed aluminum body and is powered by a 300-hp engine.

Height is 38.4-in., width, 69.7-in. and length is 180.06-in. Road clearance is only 5 in.

The synchromesh transmission is mounted behind the passenger compartment and connects with a special rear suspension. Headlight units revolve into the body when not in use.



Oldsmobile Golden Rocket looks like an answer to 1960 demands



Pontiac Club de Mer provides interest for the sports car crowd

Chevrolet Impala incorporates plenty of safety features

Chrysler's Twinsburg Plant

Chrysler Corp. has started its $90-million stamping plant near Twinsburg, O.

John E. Brennan, general manager of Chrysler's automotive body division, says this is the first step in a $1-billion expansion program planned for the next five years. The plant is expected to be in partial operation by the end of 1956.

The plant will turn out 300 different kinds of stampings for all Chrysler automobiles. Its daily capacity is 1200 tons of finished parts from 2000 tons of steel. Some 800 tons of scrap will be baled automatically and returned to Bethlehem, Jones & Laughlin and Republic.

ONE OF A SERIES:

What makes a cylindrical roller bearing good?

RETAINERS "requirement-engineered" for your kind of service

The basic parts of a roller bearing are the rollers, the races, and the *retainer* which locates and guides the rollers. There are significant differences in the design and construction of retainers, which influence bearing cost and performance. Some are simple and economical, well adapted for volume production; others are more costly but insure improved roller guidance, or cooler and smoother operation, or longer heavy-duty service. Beginning with the most elementary, here are the seven basic types in current use.

HYATT MAKES ALL SEVEN TYPES . . . EACH THE FINEST OF ITS KIND! You will find complete details in HYATT General Catalog No. 150, or your nearby HYATT Sales Engineer will gladly help you choose the type best suited to your requirements. Remember, HYATT is America's *first* and *foremost* maker of cylindrical roller bearings. Hyatt Bearings Division of General Motors, Harrison, N. J.

GM GENERAL MOTORS

HYATT ROLLER BEARINGS

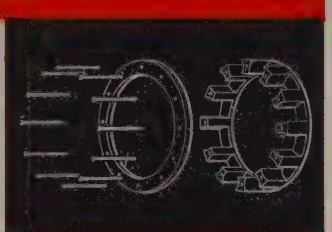
TRUNNIONED ROLLER CAGE—Economical for volume use on thin-annulus bearings. End rings are hardened steel stampings, connected by riveted bars interspersed between rollers to form an integral unit. Races can be omitted if desired.

POCKETED END RING CAGE — Designed for fairly large bore bearings in heavy-duty service. Rollers are guided accurately by pockets drilled in bronze end rings. Riveted connecting bars form an integral unit, so races can be omitted if desired.

STAMPED STEEL SEPARATOR — Economical for volume use on wide range of bearings with short rollers. A single steel stamping with bars coined to conform to roller contour. Simple, open design assures large lubricant capacity and good circulation.

FORMED BAR CAGE—Well adapted for volume use on heavy-duty bearings. Hardened steel end rings are connected by cold-rolled shaped bars conforming to roller diameter. Insures quiet operation, better roller guidance, and the smooth surface of bars protects rollers.

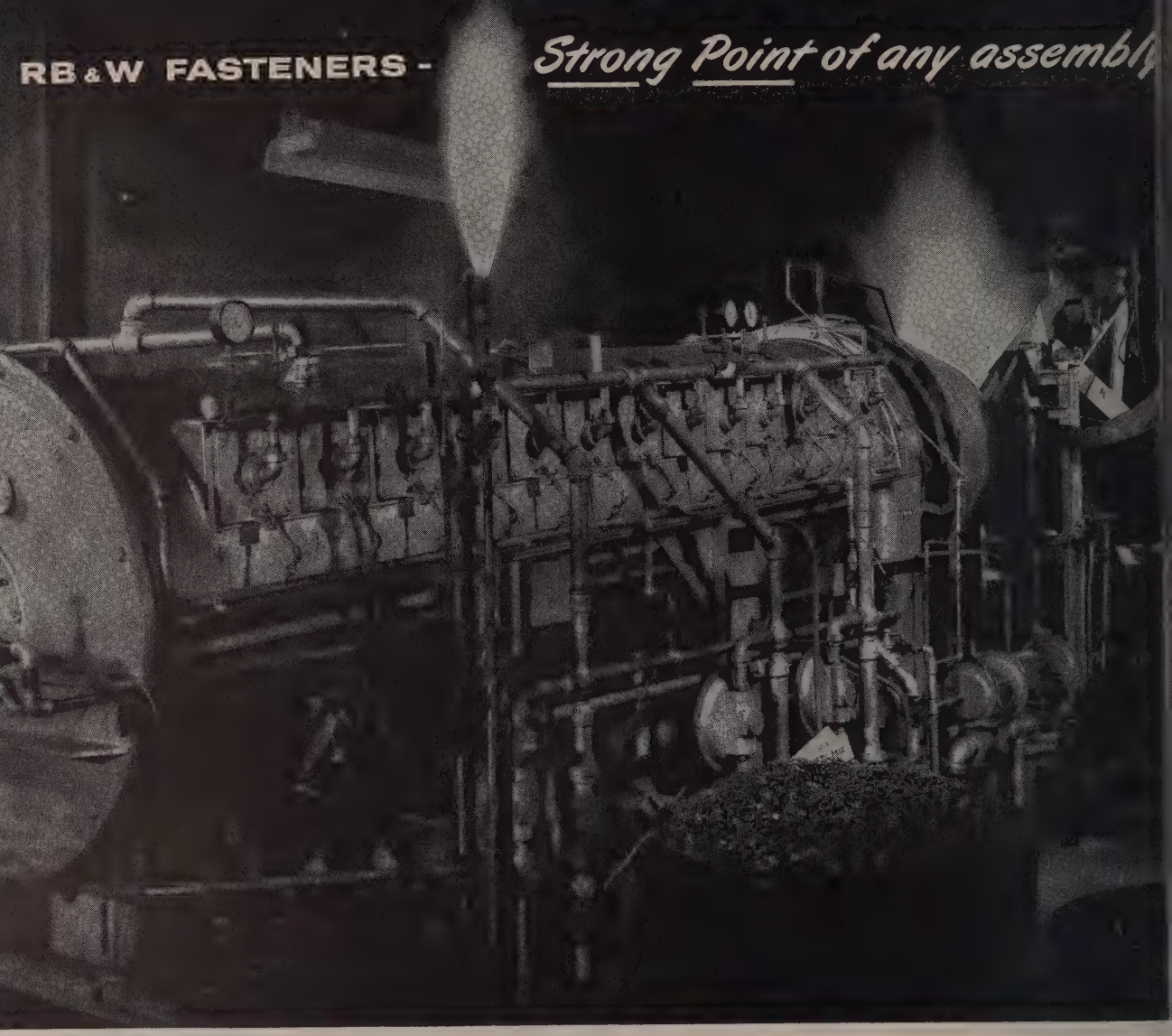
DRILLED POCKET CAGE—Used on better-grade bearings to provide extremely close control of rollers, which operate in pockets drilled and reamed in bronze cylinder. Riveted ring on one end retains rollers permanently, so races may be omitted if desired.



SEPARABLE BROACHED POCKET CAGE—Used only on finest high-speed bearings. An integral bronze cylinder with pockets broached for maximum uniformity. Insures minimum friction, better oil circulation for cooling. Rollers can be removed for inspection.

NON-SEPARABLE BROACHED POCKET CAGE—Similar to the above and offers all the same operating advantages. Used for "blind" installations where rollers must be retained with inner or outer race. Roller drop controlled by deforming bars after rollers are placed.

RB&W FASTENERS - *Strong Point of any assembly*



Gas chamber for fasteners that lengthens their life

CARBURIZING of fasteners is being done here . . . *GAS* carburizing. This method stands head and shoulders above the bath type treatment. It gives greater control of surface hardness, of quality.

Above, Gene Luzzi, has just loaded a hopperful of *Spin-Lock* screws into the chamber. Heated and then quenched under his experienced eye (11 years with RB&W), the screws emerge with deeper, more uniform case hardness, and controlled core strength. RB&W hinge pins, tapping screws and other fasteners get their longer life in this department.

If there's a better method or some extra special equipment that can help turn out the best fasteners possible, you're sure to find it in RB&W plants. With the most modern and complete facilities available, RB&W's skilled operators — many of whom are second generation RB&W men — can put their experience to best advantage.

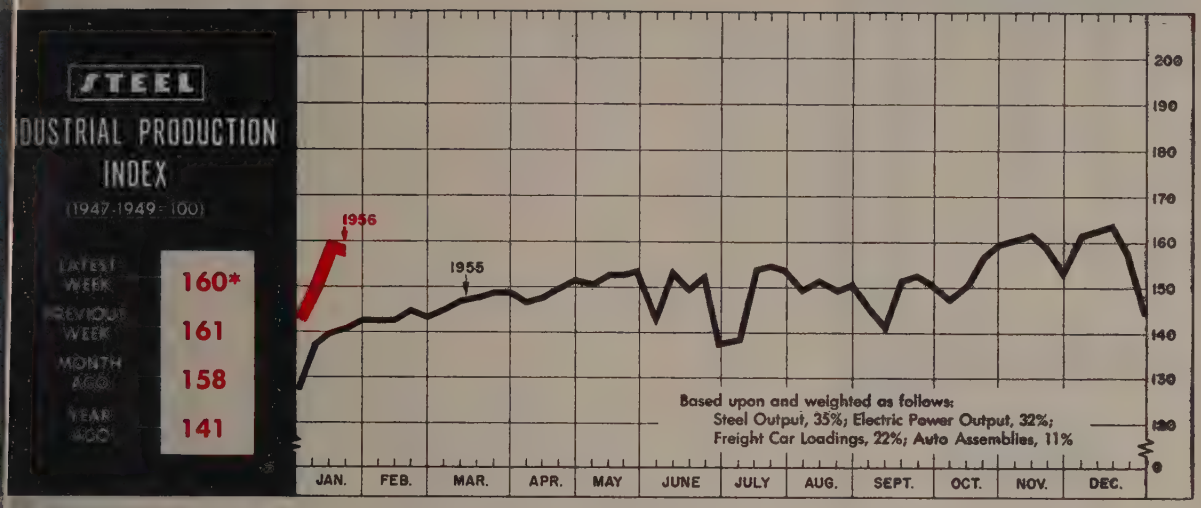
This combination of facilities, experience and quality control can't miss. It assures you more quality for your money . . . a reliable source of supply . . . and strong fasteners that never let you down.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B & W

110th year

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors** from coast to coast.



k ended Jan. 21*

Steel Leads Way in Upward Trend

MID increasing signs of declining siness, there is still plenty of timism pointing to record or ar-record levels of activity this ear.

Take the rising output of the eel industry. The American Iron Steel Institute reports that the ation's steel mills produced 2,-37,000 net tons of ingots and stings in the week ended Jan. 2, shattering the record (2,428,-00 tons) set only the week before. the week ended Jan. 23 last ear, output was 2,051,000 net ns.

No Letup — Economists are eeping a close watch on steel op-ations for signs of a break be-use of decreased activity in the tomotive industry, but no slack as appeared. For over a year, otordom has practically con-olled the distribution of steel, its eavy demands taking precedence ver most other users' wants. Now at cars are slowing down, the thers" are getting in their licks. ppliance makers are in the fore-ont here.

But it looks like the sledding ill be tough for a little while nger, at least. Steel producers eport little easing in the auto arket for their products, prob-ly because of some inventory uilding in anticipation of the usu-springtime push. It will be sec-ond quarter at least before any easing shows up in the mills. There will probably be a push then to convert output to light plates and structurals to satisfy a market that has been yelping for steel for months.

Capacity Operations—Avery C. Adams, president of Pittsburgh Steel Co., goes farther than most steelmen. He says his company will be at capacity for at least the first nine months of 1956. Mr. Avery is prompted to take such a long-term view because he is convinced that today's steel market is genuinely strong.

AISI anticipates that operations in the week ended Jan. 29 will be 2,413,000 net tons, or 98 per cent

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,413[1]	2,437	2,051
Electric Power Distributed (million kw-hr)	11,550[1]	11,594	9,981
Bitum. Coal Output (1000 tons)	10,610	9,270	8,680
Petroleum Production (daily avg—1000 bbl)	7,000[1]	7,014	6,695
Construction Volume (*ENR*—millions)	$608.2	$461.8	$257.2
Auto, Truck Output, U. S., Canada (*Ward's*)	177,625	181,742	190,155
TRADE			
Freight Car Loadings (1000 cars)	720[1]	710	635
Business Failures (Dun & Bradstreet)	269	245	265
Currency in Circulation (millions)[3]	$30,632	$30,914	$29,959
Dept. Store Sales (changes from year ago)[3]	+5%	−11%	+16%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,798	$21,702	$21,003
Federal Gross Debt (billions)	$280.2	$280.3	$278.5
Bond Volume, NYSE (millions)	$22.5	$19.6	$20.9
Stocks Sales, NYSE (thousands of shares)	11,372	12,101	14,017
Loans and Investments (billions)[4]	$85.7	$86.5	$85.5
U. S. Govt. Obligations Held (billions)[4]	$29.7	$30.0	$36.5
PRICES			
STEEL's Finished Steel Price Index[5]	209.10	209.10	194.53
STEEL's Nonferrous Metal Price Index[6]	270.4	271.0	216.4
All Commodities[7]	111.5	111.7	110.2
Commodities Other than Farm & Foods[7]	119.9	119.9	115.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

BAM!

4 OPERATIONS IN 1 STROKE CUT COSTS 29%

Bendix Aviation faced a problem: cost of this fuel-pump housing had increased until the product might have to be abandoned.

Could Presteel retool the original housing at lower cost? Backed by 73 years of stamping know-how, we went to work.

We designed a brand-new 4-draw tooling combination to do most of the job in one fast operation. Out went one annealing operation, three handling operations, and the use of three presses!

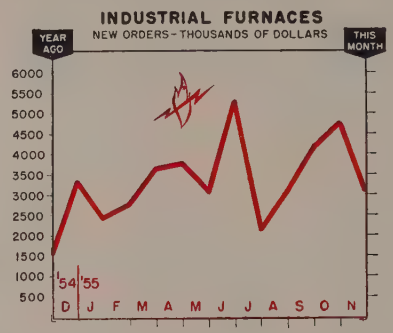
RESULT: Manufacturing costs, less materials, cut 29%. Labor requirements reduced substantially. Production time slashed 83.3%. 18 days' previous output produced in three days!

IF YOU HAVE a troublesome stamping problem, let us tackle it.

Your part has a precedent at Presteel

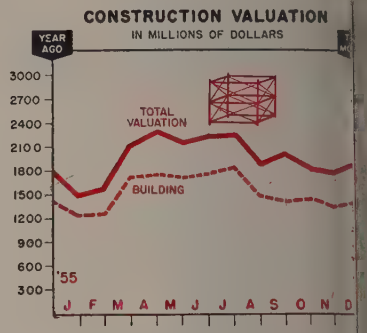
WORCESTER PRESSED STEEL COMPANY

703 Barber Ave., Worcester 6, Mass.
Please ask your representative to call ☐
Please send newest brochure ☐
Name _____
Title _____ Company _____
Street _____
City _____ Zone _____ State _____



	1955	1954	1953
Jan.	4,973	3,086	5,398
Feb.	5,616	3,086	6,009
Mar.	7,345	4,079	5,101
Apr.	7,639	3,496	5,140
May	6,205	5,848	4,698
June	10,616	5,663	4,910
July	4,338	1,664	6,334
Aug.	6,273	2,570	7,519
Sept.	8,351	2,534	4,442
Oct.	9,568	3,837	3,486
Nov.	6,180	3,188	3,430
Dec.	....	6,847	3,081

*Preliminary
Industrial Heating Equipment Assn. Inc.



	37 States			
	Total		Building	
	1955	1954	1955	1954
Jan.	1,504.5	1,151.9	1,255.1	935.6
Feb.	1,581.1	1,221.3	1,278.6	977.5
Mar.	2,134.8	1,527.5	1,748.6	1,199.8
Apr.	2,322.1	1,691.9	1,776.1	1,401.6
May	2,185.1	1,925.3	1,737.1	1,497.6
June	2,255.2	1,733.3	1,793.7	1,376.7
July	2,271.5	1,836.9	1,851.6	1,386.9
Aug.	1,894.8	1,572.9	1,516.9	1,243.3
Sept.	2,034.9	1,816.2	1,442.2	1,424.2
Oct.	1,862.7	1,965.3	1,474.8	1,522.8
Nov.	1,796.8	1,498.9	1,388.3	1,199.8
Dec.	1,920.8	1,828.8	1,438.0	1,463.0
Tot.	23,764.3	19,770.2	18,701.0	15,628.8

F. W. Dodge Corp.

Charts copyrighted, 1956, STEEL

of the new weekly capacity. That would have been virtually 100 per cent of last year's capacity.

Getting Stronger—Other bright spots are carloadings and electric output. The Association of American Railroads reports that loadings for revenue are continuing their upward trend. For the week ended Jan. 14, total loadings amounted to 710,338 cars, or 16.2 per cent over the preceding week's, 11 per cent better than those of the corresponding week in 1955.

Electric energy continues to break the 11-billion-kw-hr mark, with 11.594 billion kw-hr produced in the week ended Jan. 14. In only two weeks since mid-November (Thanksgiving and Christmas) has the industry fallen beneath the mark.

Good Combination—These three combined to keep STEEL's industrial production index near 1955's mark, with the week ended Jan. 14 pegged at 161 (1947-1949 = 100) and the following week estimated at 160.

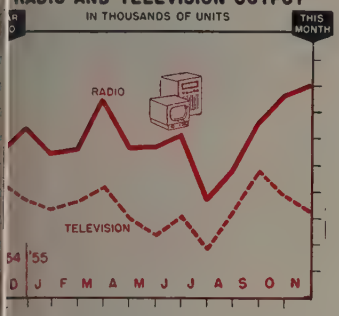
Auto Production Heads Down

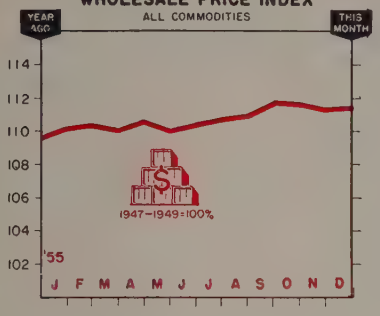
The big question mark continues to be automobile production. Producers are paring their production goals every week to cut dealers' stocks. *Ward's Automotive Report* says that in early December, 2,338,350 cars were scheduled for first-quarter output. In mid-December, this was cut to 2,067,000 and now it has been cut again to 1,874,000 units. This is 12 per cent under the production in last year's first quarter, when output ran heavy in the industry's traditionally weak quarter. Even at that, *Ward's* points out that the current figure is only about 15,000 units below the best quarter in 1950, the industry's second-best year.

Ward's further points out that a recent survey of automotive parts makers indicates they are not suffering too much from cutbacks. The main effect has been the elimination of much costly overtime which was eating into suppliers' profits. Many have returned to a normal 40-hour week. Any layoffs reported are negligible and some even report strengthening of their work forces.

With last week's layoffs at Chrysler Corp., payroll cuts since mid-December come to about 23,000 workers.

Car sales in the Jan. 1-10 period ran 5.4 per cent above the year-ago period. At 137,000, the figure





	Radio		Television	
	1955	1954	1955	1954
an.	1,068	872	655	421
eb.	1,090	769	703	427
lar.	1,482	940	831	600
pr.	1,100	745	583	458
lay	1,114	722	467	396
une	1,205	838	590	544
uly	718	438	344	307
ug.	948	785	648	633
ept.	1,302	932	940	948
ct.	1,500	998	760	921
ov.	1,581	1,099	632	859
ec.	....	1,262	...	833
otal	....	10,400	...	7,347

Radio-Electronics-Television Mfrs. Assn.

	1955	1954	1953
Jan.	110.1	110.9	109.9
Feb.	110.4	110.5	109.6
Mar.	110.0	110.5	110.0
Apr.	110.5	111.0	109.4
May	109.9	110.9	109.8
June	110.3	110.0	109.5
July	110.5	110.4	110.9
Aug.	110.9	110.5	110.6
Sept.	111.7	110.0	111.0
Oct.	111.6	109.7	110.2
Nov.	111.2	110.0	109.8
Dec.	111.3*	109.5	110.1

U. S. Bureau of Labor Statistics
*Preliminary

ints to another 500,000-plus les month for January. That's 6-million-plus annual rate.

siness Enthusiasm Still High

Businessmen in other industries e not putting the damper on eir enthusiasm for 1956. R. S. evenson, president of Allis-almers Mfg. Co., says his com-ny is looking forward to as good sales year as it had in 1955. Un-r favorable circumstances, he inks it can be a little better. y Mfg. Co. says its backlog at e beginning of the year was 50 r cent higher than it was six onths before.

The Foundry Equipment Manu-cturers Association reports its dex for new orders (1947-1949 100) jumped to 154.4 in Novem-r, up from 108.6 the previous onth. Morrison-Knudsen Co. Inc., oise, Idaho, reports its backlog incompleted construction con-acts stands at more than $410 illion. H. W. Morris, president, ys: "We look forward to full-ale operations throughout 1956 d most of 1957, independently new business which may be ooked in these periods."

National Machine Tool Builders' ssociation reports the index of new orders (1945-1947 = 100) rose to 530.8 in December, the highest level since June, 1951. In the history of the industry, the index has been higher only seven times, all in wartime months.

Don G. Mitchell, chairman and president, Sylvania Electric Products Inc., says he anticipates 1956 sales about 20 per cent greater than 1955's.

Spending Remains Strong

Perhaps some of this optimism can be traced to more money and the desire on the part of consumers to spend it. Jobs are at an all-time peak, according to the Bureau of Labor Statistics, and take-home pay is rising. Coupled with stable living costs, the bureau says the purchasing power of the factory worker increased 6 per cent from December, 1954, to December, 1955. In evidence of this, the Board of Governors of the Federal Reserve System says retail sales rose to a new high in December, and early January continued at advanced levels after allowing for seasonal influences. Dun & Bradstreet Inc. states that bank clearings in the week ended Jan. 18 rose 12.9 per cent in 25 cities, excluding New York.

Even the smallest size Reamers are Standard with L&I

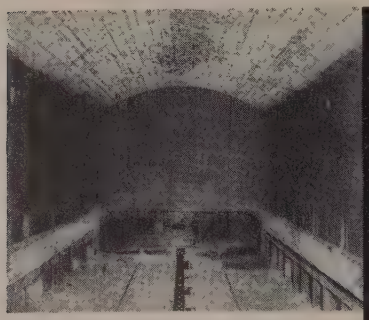
L&I

The Reamer Specialists

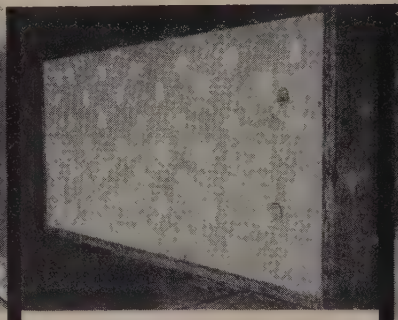
LAVALLEE & IDE, INC.

CHICOPEE, MASS.

Profitable trends in the use of refractories



Car-type forge furnace with Laclede castable refractory walls



Soaking pit cover made with Laclede Plastic refractory

Car-type furnace lined with Laclede Castable and Plastic Refractories

Batch-type reheating furnace lined with Laclede Castable

Walking beam furnace with Laclede Plastic side and end walls

Time and cost savings explain increasing use o LACLEDE Castable and Plastic Refractories

Increasingly successful and profitable uses of castable and plastic refractories are changing refractory practices in many mills and plants. Experience shows that when castables and plastics are properly selected and installed, time and cost savings may amount to 300% or more. Results plus ease and speed of installation contribute to these savings.

Correct selection of castables and plastics is simplified by the availability of a complete range of Laclede-Christy products. Laclede-Christy produces castables and plastics to meet every condition.

Laclede offers refractories for high or moderate temperature service, and to meet specific insulating property requirements. Specific qualifications such as refractoriness, strength, thermal conductivity, abrasion-resistance and erosion resistance are met in varying degrees, according to the castable or plastic recommended and selected.

Undoubtedly you can use Laclede-Christy Castables and Plastic Refractories to profitable advantage. What's your situation? What more would you like to know? Your nearby Laclede-Christy representative will be glad to give you specific information.

Laclede-Christy Castable and Plastic Refractories

Castables for high temperature service to 2400° F and higher: Steelcast, Firmcast, Super Castable, Gun Cast and 3000° Castable.

Castables for insulating properties and service temperature to 2400° F: Porelite, Porelite 50, Porelite VL.

Pitco Plastic — for high temperature service (3150° F), where metal oxide penetration is severe.

Super-Set Plastic — for high temperature service (3150° F), where air dried bond is a factor, and where heat cannot be applied shortly after ramming.

LACLEDE-CHRISTY COMPANY DIVISION

LACLEDE-CHRISTY COMPANY FOUNDED 1844 Quality First

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DONALD H. DALBECK
. . . heads Reed-Prentice, Package Machinery

Donald H. Dalbeck was elected president of Package Machinery Co., East Longmeadow, Mass., and its subsidiary, Reed-Prentice Corp., Worcester, Mass. He continues as treasurer of both companies. Roger L. Putnam Jr., controller-secretary of Package Machinery, assumes this position for Reed-Prentice. Iver G. Freeman, vice president-engineering and research, was named chairman of the Reed-Prentice management committee.

Pettibone Mulliken Corp., Chicago, appointed Wade Meloan vice president. He is replaced as treasurer by Lawrence E. Denman.

Louis W. Jander was named general sales manager, Henry Disston Division, H. K. Porter Company Inc., Philadelphia. Formerly industrial sales manager, Mr. Jander succeeds Walter H. Gebhart, now a consultant.

E. J. Mercer was made general manager, construction machinery division, Allis-Chalmers Mfg. Co., Milwaukee. He was managing director of Allis-Chalmers Great Britain Ltd.

Tube Turns Division, National Cylinder Gas Co., appointed L. J. Morris assistant district manager at Pittsburgh to succeed W. C. Robinson, now an assistant sales manager, eastern division.

J. LOUIS REYNOLDS
. . . Reynolds Metals executive v. p.

J. Louis Reynolds was elected executive vice president, Reynolds Metals Co., Louisville, succeeding Marion M. Caskie, retired. Mr. Reynolds was vice president-operations.

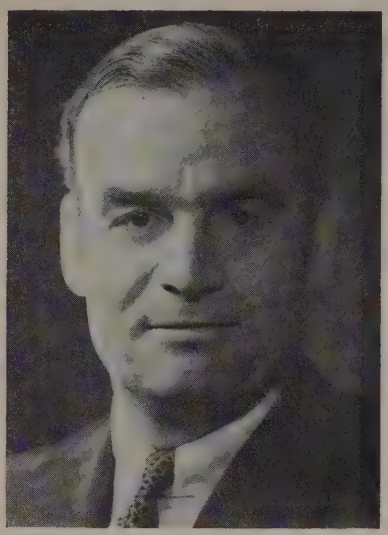
Richard B. Tullis was elected vice president, Harris - Seybold Co., Cleveland. He was president of Miller Printing Machinery Co.

Earl G. Ward was made director of purchasing, Ford Motor Co., Dearborn, Mich., to succeed James O. Wright, now assistant general manager of the Ford Division.

Maurice H. McKinnon was appointed manager of the Hagerstown, Ind., plant of Perfect Circle Corp. He succeeds George S. Myers who resigned late in 1954. Mr. McKinnon was production superintendent.

W. F. Stark was elected vice president, Promat Division of Poor & Co., Chicago, to succeed the late Allan E. Chester. William F. Mooney was made vice president-sales.

Reid S. Byers was appointed manager of the Decatur, Ala., yard of Ingalls Shipbuilding Corp. He replaces J. B. Kopp, now assistant to the vice president-operations in Birmingham. Mr. Byers was with Hillman Barge & Construction Co., Brownsville, Pa.



CLARENCE M. TAYLOR
. . . president of Harris Calorific

Clarence M. Taylor, one-time executive vice president of Lincoln Electric Co., was elected president of Harris Calorific Co., Cleveland. He succeeds the late Lorn Campbell Jr. John R. Milligan was elected vice president and will direct administrative functions.

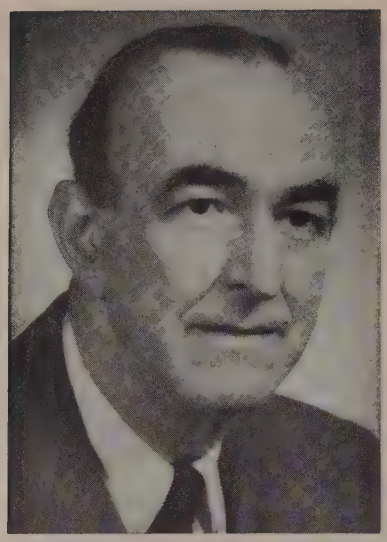
L. W. Shelton was made general purchasing agent, Kennecott Copper Corp., New York. He succeeds R. Park Lamborn who continues in an advisory capacity. W. K. Field, formerly purchasing agent, Utah Copper Division, replaces Mr. Shelton as assistant general purchasing agent.

John Lawrence was elected president and chief executive officer of Joy Mfg. Co., Pittsburgh. J. D. A. Morrow, former president, is now chairman. W. L. Wearly was elected executive vice president and H. C. Nyquist vice president-general sales.

Elmer B. Dunkak was elected to the new position of vice president-sales at Selas Corp. of America, Philadelphia.

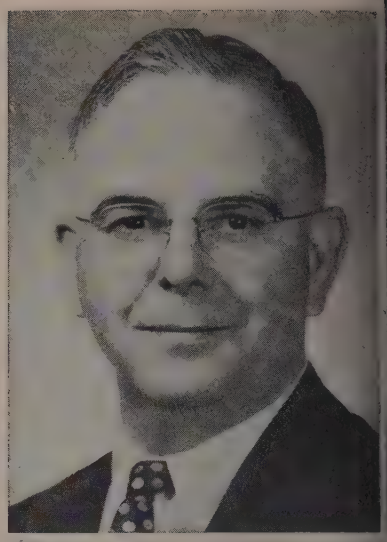
Walter Rivers was promoted to general sales manager, metal container division, Southern States Iron Roofing Co., Birmingham.

Edward G. McGlinchy was appointed manager of plumbing brass goods sales at Waterbury



DR. JAMES C. HODGE
. . . joins Warner & Swasey as v. p.

CHARLES J. LEE
. . . Wilson Steel & Wire v. p.



WILLIAM J. LOACH
. . . Firth-Loach executive v. p.

Mfg. Co., Waterbury, Conn., division of Chase Brass & Copper Co.

Dr. James C. Hodge was elected a vice president of **Warner & Swasey Co.**, Cleveland. For the present, he is concerned with problems of manufacture. Dr. Hodge recently resigned as president of Wellman Engineering Co.

Leonard S. Ham was promoted to superintendent of the hot strip department of **Granite City Steel Co.**, Granite City, Ill. He succeeds **Clarence R. Mitchell**, now divisional superintendent in charge of the company's rolling mills. **Bert D. Houston** replaces Mr. Ham as assistant superintendent, hot strip department.

Sparks-Withington Inc. appointed **Glenn A. Richardson** vice president-general manager of its Allied Steel & Conveyors Division at Detroit.

John R. Bremer was appointed purchasing agent of **SKF Industries Inc.**, Philadelphia. He succeeds **Harry J. Lance**, retired.

H. E. Moore succeeds **Lee J. Hoffman**, retired, as manager of the Franklin, Pa., plant of **Chicago Pneumatic Tool Co.**

William B. Ilko was made administrative assistant to the vice president and director of sales, **American Chain & Cable Co. Inc.**, New York. He was general sales manager, Simonds Abrasive Co.

Wilson Steel & Wire Co., Chicago, elected **Charles J. Lee** vice president in charge of mill operations and new product development. He was administrative assistant in charge of operations and sales.

James C. Patton was made Detroit district sales manager for **A. Finkl & Sons Co.**

Edmund T. Price was elected chairman and **Herbert Kunzel** president of **Solar Aircraft Co.**, San Diego, Calif. Mr. Price was president and general manager. Mr. Kunzel was executive vice president, secretary and manager. **Frederick A. Schneller** was made purchasing agent.

William J. Loach was elected executive vice president of **Firth-Loach Metals Inc.**, McKeesport, Pa. A co-founder of the firm, he was vice president-general manager. **M. A. Cancelliere** was elected chairman.

W. F. Rowley was made purchasing agent of the construction machinery division of **Clark Equipment Co.**, Benton Harbor, Mich.

A. Clark Daugherty, market research manager, **Rockwell Mfg. Co.**, Pittsburgh, was named assistant to the president.

Willis J. Oldfield was made sales

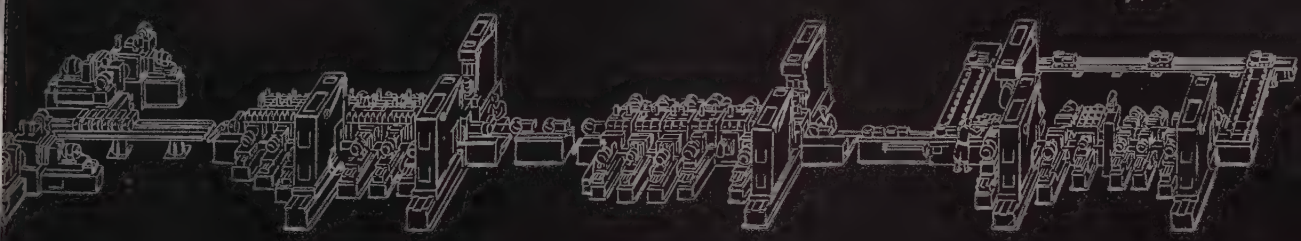
EDMUND T. PRICE

HERBERT KUNZEL

. . . chairman and president of Solar Aircraft Co.

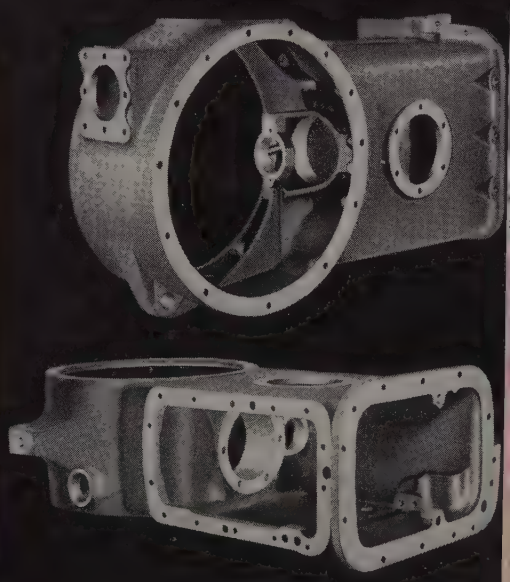
Tractor Differential Housings from Rough Castings to Assembly!

Another Transfer-matic by Cross



The new Cross Special Machine above is one of four sections which constitute a complete production line. Together, they process 46 tractor differential housings per hour from rough foundry castings to assembly. The line is 225 feet long with 31 stations. It performs 313 operations, including 19 milling, 7 cross-facing, 110 drilling, 17 boring, 72 chamfering, 4 spot-facing, 8 reaming and 76 tapping.

Like all Cross machines, the parts—even tooling details—are made to interchangeable tolerances for fast, easy maintenance and to provide flexibility for model changes—an important Cross advantage both from the standpoint of operating costs and investment. This production line is another example of Cross Sectionized (Segmented) Automation.



Established 1898

THE **CROSS** CO.

First in Automation

DETROIT 7, MICHIGAN

W. LAIRD DAVIS
. . . Shenango Furnace pig iron sales mgr.

NELSON E. LEWIS
. . . American Welding & Mfg. plant supt.

A. F. TYDEMAN
. . . purchasing director at Kropp Forge

promotion manager, **AC Spark Plug Division**, General Motors Corp., Flint, Mich.

W. Laird Davis was made manager of pig iron sales for **Shenango Furnace Co.**, Pittsburgh. He continues as assistant secretary.

George D. Fraunfelder, director of engineering, was elected vice president-engineering of **Easton Car & Construction Co.**, Easton, Pa. **U. M. Johnson**, project engineer, was elected vice president-industrial sales.

Phil R. Becker was named general sales manager, **Midwest Piping Co. Inc.**, St. Louis. He was sales manager, welding fitting division.

Lawrence R. Greenhaus was elected vice president-sales, **Luria Building Products Inc.**, Bristol, Pa. He was New York district sales manager for Luria Engineering Co.

Webster Spring Co., Webster, Mass., appointed **Robert H. Vanderkay** vice president-general manager.

Nelson E. Lewis was made superintendent of the newly acquired Niles, O., plant of **American Welding & Mfg. Co.** The building products division, now at Warren, O., soon will be moved to the new plant.

Harry S. Clarke was made assistant sales manager, railway division, **Dana Corp.**, Toledo, O.

Rex L. Nicholson was elected president and chief executive officer of **Liquid Carbonic Corp.**, Chicago. He was president of Pacific Tractor & Implement Co., Richmond, Calif.

Clinton L. Howe was made district sales manager, Gerrard Steel Strapping Division, U. S. Steel Corp., with headquarters at Englewood, N. J. He succeeds Eugene B. Kovats, now district sales manager at McKees Rocks, Pa.

L. B. Kuhns and **B. J. Fletcher** were named assistant chief engineers for **Aluminum Co. of America**, Pittsburgh. Mr. Kuhns continues as chief construction engineer. Mr. Fletcher continues as chief hydraulic engineer.

Kropp Forge Co., Chicago, named **A. F. Tydeman** director of purchasing to succeed **Edward A. Ulvestad**, now assistant production manager. Mr. Tydeman was assistant controller.

National Lock Co., Rockford, Ill., named **C. M. Oberling** director of purchases; **Carl Stokstad**, purchasing agent; **and Richard E. Smith**, assistant purchasing agent.

Alfred F. Bauer, chief engineer, **Doehler-Jarvis Division**, National Lead Co., Toledo, O., assumes added duties as assistant general manager.

W. R. Wyckoff was named product manager of **Townsend Co.**, New Brighton, Pa. He formerly was assistant manager, midwest sales division, Chicago.

Howard J. Daly fills the new post of vice president in charge of crude abrasive plants for **Norton Co.**, Worcester, Mass.

C. V. Blackburn was made executive assistant to the president of **Stran-Steel Corp.**, Detroit.

OBITUARIES . . .

Herman W. Nelson, 79, founder of **Herman Nelson Corp.**, which later merged with American Air Filter Co., died in Moline, Ill., Jan. 11.

Charles J. Hardy, 89, former chairman and president, **American Car & Foundry Co.**, New York, died Jan. 18.

Oscar A. Koogler, 64, president, **Midwest Tool & Engineering Co.**, Dayton, O., died Jan. 12.

Ernest A. Reynolds, 59, general superintendent, **Dolomite Products Co.**, Rochester, N. Y., died Jan. 8.

Simon I. Edinburg, manager, Boston office, **Luria Steel & Trading Co.**, died Jan. 12.

Frederick T. Atwill, 74, founder of **Liner-Atwill Co.**, Hartford, Conn., died Jan. 10.

Only Kearney & Trecker has Twin Screw Knee Support

Available under Tool-Lease program

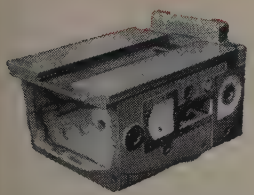
Now TF Series milling machines give you broad and equal distribution of all work loads ... prolonged economy at critical points ... unmatched rigidity under heavy cuts

KEARNEY & TRECKER'S new line of TF Series Plain, Universal and Vertical milling machines gives you a combination of more outstanding design and operating features (illustrated below) than any other knee type milling machine on the market today.

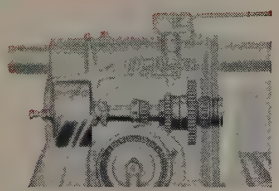
Among these features is the *exclusive* Kearney & Trecker TWIN SCREW KNEE SUPPORT design — the *double support* arrangement that distributes most effectively the weight of much larger, heavier knees, saddles and tables. This *balanced design* substantially increases stability under the heaviest loads ... offers greater resistance to torsional thrust under all cuts ... divides the wear factor in half thus assuring greater, longer-lasting accuracy.

The new TF Series line of production milling machines is available in five sizes — No. 2 to No. 6 from 10hp to 50hp. For complete specifications, and what these TF's can do for you, see your nearest Kearney & Trecker representative, or write direct to Kearney & Trecker Corp., Milwaukee 14, Wis.

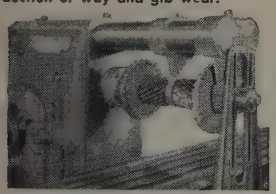
5 more reasons why TF Series milling machines are way out front in rigidity



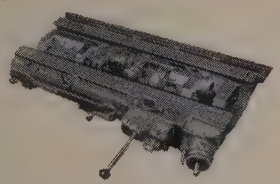
Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life, better finish and quieter operation.



Double "Vibra-Void" Overarms — Two solid steel bars, mounted completely through column, void vibration at source, afford more rigidity and resistance to deflection than any other type support. Design also greatly simplifies changing of arbors and cutters.



"Fron-Trol" Operating Convenience — Front-mounted controls include feed selection, Mono-Lever table feed and rapid traverse, automatic cycle table feed and rapid traverse controls, table handwheel, saddle clamping gib and backlash eliminator. Machines have 2" dia. table feed screw.

Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces. Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.

KEARNEY & TRECKER MILWAUKEE

BUILDERS OF PRECISION AND PRODUCTION MACHINE TOOLS SINCE 1898

KEARNEY & TRECKER CORPORATION
6790 W. National Avenue, Milwaukee 14, Wisconsin
Please send me Catalog No. TF-50 with details on new line of TF Series Plain, Universal and Vertical milling machines.

Name.....
Title.....
Company.....
Address.....
City.....Zone.....State.....

Here it is...!

THE NEW "48-FRAME" MOTOR DESIGN THAT GIVES YOU Century INDUSTRIAL QUALITY

Everything you asked for and more. Smaller, yes... and better, too. Here is traditional Century dependability, smooth-running and quietness under load... now skillfully engineered into the compact new "48-Frame" design.

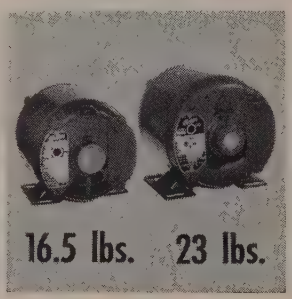
These great new Century "Industrial Quality" motors are now available in sizes from 1/20 to 1/3 H.P.... developed specially for industrial users.

ON NEW EQUIPMENT OR FOR REPLACEMENT...

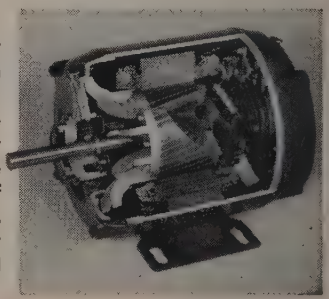
when you see the red "C" on the new weight-saving, space-saving "48-Frame" motors, you're assured of Century's *traditional industrial ruggedness*. For information and for fast service, call or write your nearby Century District Sales Office or Authorized Distributor.

We Invite Your Comparison of...

engineering — Weight savings up to one-third are made possible without "skimping" on the vital "active materials", simply by eliminating dead weight and using new materials. The result is smaller-diameter motors that are not merely "just as good" but actually superior to the famous Century "56-Frame."



design — For time-saving maintenance, "GITS"-type oilers for sleeve bearings are placed high on the end-brackets, allowing easy oiling from either end of the motor... cluster-type integrally cast fan at the rear end of the rotor draws a steady stream of cooling air over the coilheads... "Square" stator iron permits air to pass between the core and shell, cooling the whole width.



Performance-Rated © MOTORS
1/20 to 400 H.P.

CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*

56

Kaiser Branches Out

Kaiser Aluminum & Chemical Corp.'s $400-million expansion includes container plants

CONSUMPTION of aluminum sheet and foil by the food container market (now 40 million lb a year) may double by 1960. Frozen food, bakery, confectionery, nursery and dairly industries use a billion aluminum food containers annually.

Kaiser Buys—Kaiser Aluminum & Chemical Corp. has purchased Foil Kraft Inc., Los Angeles, aluminum container producer for the frozen food industry. Kaiser has been Foil Kraft's principal supplier.

A. J. Johnson, Foil Kraft's president, will continue under the new management, according to D. A. Rhoades, Kaiser vice president and general manager.

Dinner Trays—Foil Kraft developed compartmented dinner trays, both circular and rectangular. Fabricated from light-gage aluminum sheet and foil, they feature a rolled rim to facilitate securing of the aluminum foil overwrap. Last year the company opened a completely mechanized 50,000 sq-ft plant in Los Angeles.

Kaiser Builds — Bids are being called for by Kaiser on a $1-million aluminum container plant at Wanatah, Ind., which will be in operation this summer. A 45,000 sq-ft insulated aluminum facility employing 50 to 75 persons, it will be a relatively short rail and highway distance from Kaiser's new sheet and foil rolling mill at Ravenswood, W. Va., which is also to be in operation this summer.

Case Forms Subsidiary

W. A. Case & Son Mfg. Co., Buffalo, organized a subsidiary, Case Mfg. Corp., to take over the manufacturing division of the parent company. The firm makes plumbing, heating, refrigeration and air conditioning supplies. The subsidiary will maintain headquarters in Buffalo, its manufacturing and sales departments in Robinson, Ill. Officers of the subsidiary are: Chairman, F. W. Harder; president, C. W. Farrar; executive vice president and general manager, W. G. Young; vice president and sales manager, K. D. Gould; vice president and treasurer, F. W. Welling; secretary, H. M. Holtzmann.

Eastern Stainless Expanding

Eastern Stainless Steel Corp., Baltimore, is expanding its capacity for making stainless and other high-alloy steel sheets. A Sendzimir, reversing, cold-process mill will be installed, together with auxiliary machinery and equipment. Production economies will be gained and capacity in the lighter gages of stainless sheets down to foil thickness will be greatly increased. A 20-ton electric arc furnace was installed last year, increasing the plant's melting capacity about 50 per cent.

Will Build Normalizing Line

Surface Combustion Corp., Toledo, O., was awarded the prime contract for U. S. Steel Corp.'s new continuous normalizing line for processing vitreous enameling stock at its Irvin Works, Dravosburg, Pa. The line will handle low-carbon steel stock at the rate of about 15 tons an hour to maximum temperatures of 1850°F. Surface Combustion has placed a subcontract for strip handling equipment with E. W. Bliss Co., Salem, O. Other installations will include a horizontal looping furnace, pickling, washing and drying equipment.

McGraw Buys Five Firms

McGraw Electric Co., Chicago, purchased the principal assets of W. E. Moore & Co. and four affiliated firms in Pittsburgh. Their business: The engineering, design and manufacture of steel melting furnaces, electric and gas dryers. W. E. Kerr, vice president of McGraw Electric and president of its Pennsylvania Transformer Co. Division at Canonsburg, Pa., will be in charge.

Dayton Pump & Mfg. Renamed

Dayton Pump & Mfg. Co., Dayton, O., changed its name to Tait Mfg. Co. in honor of Frank M. Tait, chairman, who founded the firm in 1908. It makes water pumps and systems, water softeners, cellar drainers and gasoline computing pumps.

Going Up

An electrical engineer checks conduit leading to lights on top of a 250-ft stack at Los Angeles' steam plant. More than 60,000 ft of Spang-Chalfant rigid steel conduit have been used so far in this $80-million plant to be completed early this year

Atlas Titanium Ltd. Organized

Mallory-Sharon Titanium Corp., Niles, O., has joined with Atlas Steels Ltd., Welland, Ont., to form a subsidiary, Atlas Titanium Ltd The new firm will supply titanium in bar, wire, sheet, strip and forged forms for world markets. At present, Mallory-Sharon will melt and produce ingots for shipment to Atlas for further processing.

National Steel Lets Contracts

Koppers Co. Inc., Pittsburgh, will build sintering plants for Weirton Steel Corp., Weirton, W. Va., and Great Lakes Steel Corp. at Zug Island, Mich. Both plants will be equipped with the biggest single iron ore sintering units in the world, officials say. Koppers also will build extensive raw ore and sinter handling systems at each of the steel producing plants. Contracts awarded to Koppers are part of National Steel Corp.'s $200-million expansion program recently announced by Ernest T. Weir, chairman.

(*Please turn to page* 70)

When you need expert foundry advice ask the man who

CALL IN A REPUBLIC PIG IRON

His thorough knowledge of foundry operations is based upon a combination of metallurgical training and years of actual foundry experience. He knows all types of pig irons and their characteristics. He knows what they will do or will not do under certain conditions. He keeps up to the minute on all the latest foundry techniques.

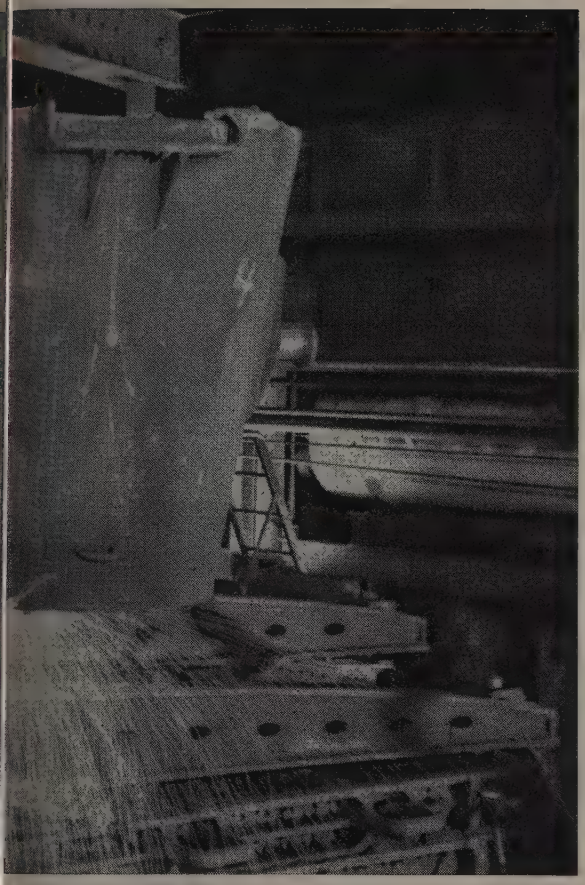
The Republic Pig Iron Metallurgist is a welcome visitor in hundreds of foundries. They rely on him for advice on pouring problems, molding practice, improving efficiency. Or for help on reducing costs, improving castings and increasing output.

Republic is the only producer of a complete line of merchant pig irons. Therefore,

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels



knows his irons—

METALLURGIST

the Republic Pig Iron Metallurgist is able to recommend the proper grade of pig iron for a specific job without hesitation or prejudice.

If you have a foundry problem, ask the man who knows his irons—call in a Republic Pig Iron Metallurgist. His service is confidential and without obligation. Mail the coupon for prompt action.

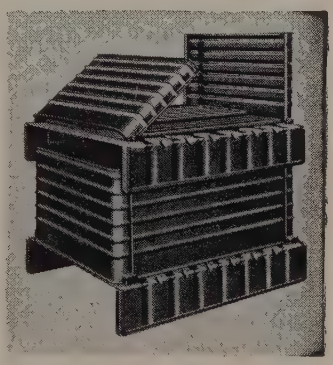
STEEL

and Steel Products

FOR HANDLING CASTINGS—Republic Chain Slings provide an exceptionally high degree of safety. Made by Republic's Chain Division, they are available in Alloy Steel, High Test Steel, and Wrought Iron. All are proof tested and warranted to meet or exceed specifications. Each type has a specific use. A Republic Chain Engineer will tell you promptly which chain sling is best suited to your particular requirement.

FOR STORING CASTINGS—Wedge-Lock Steel Shelving provides maximum loading in minimum floor space. It's specifically designed for high stacking of enormous weights—with no sagging, no swaying, no buckling. Joints actually get tighter as weight increases. Wedge-Lock Steel Shelving is completely flexible to meet changing needs. It can be assembled quickly and easily. A product of Republic's Berger Division.

FOR SHIPPING CASTINGS—Republic's Pressed Steel Division makes the PB-127 Collapsible Box. It's designed for *heavy-duty service*. It can be tiered when loaded or empty—collapsed or set up. All parts are permanently attached. The PB-127 unit solves the problem of storing and shipping empty boxes and can save you up to 66% of your storage space. Republic Materials Handling Specialists will help you design units to meet your specific needs.



REPUBLIC STEEL CORPORATION
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☐ Please have a Pig Iron Metallurgist call.
I am interested in more information on:
☐ Republic Sling Chains ☐ Republic Collapsible Boxes
☐ Wedge-Lock Shelving

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

K-9669

KEYSTONE XL COLD HEADING WIRE

282% MATERIAL SAVED...

USING KEYSTONE XL COLD HEADING WIRE

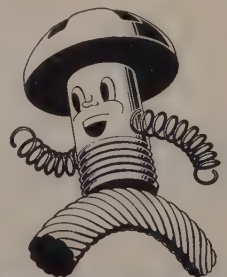
This circuit breaker part was machined at one time. But, cold-heading experts analyzed its design and decided that it could be successfully formed from Keystone "XL" Cold Heading Wire. The result—a material waste reduction from 75% to 7%—and a saving of 282% in steel, plus faster, lower cost production and a finished product that is stronger and free from defects.

Keystone "XL" Cold Heading Wire is not just ordinary cold heading wire. It is wire made to your specific order to exactly solve your difficult cold heading problems. Special drawing, annealing and coating "secrets" produce a wire of exceptional *flowability*. Originally developed for recessed head screws, Keystone "XL" Wire is now widely used to solve many of the toughest cold heading problems at great savings in time and money.

SEND FOR FREE "COLD HEADING" BOOKLET

Get your copy of a new, valuable reference book containing many technical and informative facts about the modern cold heading process. Remember, too, that Keystone specializes in all types of wire for all types of industrial needs. Write us about your need!

KEYSTONE STEEL & WIRE COMPANY, PEORIA 7, ILLINOIS



KEYSTONE WIRE for Industry

(*Concluded from page 67*)

Wilputte Coke Oven Divisio Allied Chemical & Dye Corp., Ne York, was awarded a contract t build a battery of 78 underj coke ovens and auxiliary co chemical recovery equipment Great Lakes Steel. The ovens wi more than double the capacity this coke plant which was con pleted by Wilputte in 1954. Whe the new ovens are in operatio 3800 tons of coal will be processe each day, producing 2800 tons coke.

Buys Drill-Grinder Line

Black Diamond Saw & Machin Works Inc., Natick, Mass., pu chased the manufacturing an sales rights to the drill-grinde line of Washburn Shops Divisio Worcester Polytechnic Institut Worcester, Mass. Edward Blak Co. Inc., West Newton, Mass., i the sole distributor.

Joy Mfg. Forms New Division

Joy Mfg. Co., Pittsburgh, wi build a research and testing fa cility at Buffalo to be known a its Turbo-Dynamic Division. Ob jective: The establishment of major new division producing ad vanced compressors, turbines an other air and gas handling devices

Continental Screw Building

Continental Screw Co., New Bed ford, Mass., is constructing a $250, 000 addition to be occupied by a affiliate, Hy-Pro Tool Co.

Swartwout Sells Product Line

Republic Flow Meters Co., Chi cago, acquired the Power Plant Equipment Division of Swartwout Co., Cleveland. Republic is estab lishing a Swartwout Division t carry on the manufacture and sale of Swartwout's line of steam spe cialties.

Koenig Iron Works Expands

Koenig Iron Works Inc. is build ing a $425,000 plant northwest o Houston. It will house the gen eral offices for several Koenig companies and the manufacturing facilities for King Winch Inc.

nstall Chrysler Industrial Engines

best-engineered, most-economical answer to your power problem

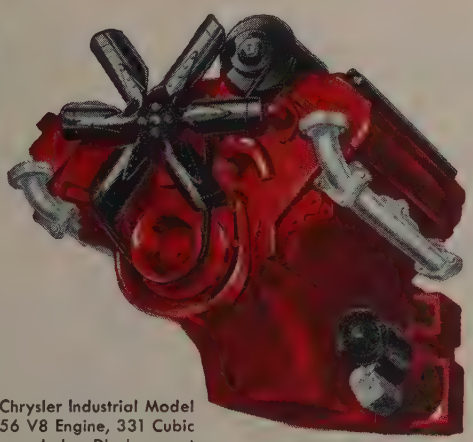
sler Power is the *dependable*, economical, lightweight er to your high-speed or high-torque power require- s. Within their power ranges, each Chrysler Industrial ne is a leader in the field and is recognized as such by facturers of almost every type of self-powered ment.

eck the specifications. Note the optional equipment n can be factory supplied or installed to meet the particular requirements of your equipment in the field. Whether equipped for Gasoline, Distillate Fuel, Propane or Natural Gas operation, Chrysler Industrial Engines offer definite advantages . . . performance, ease of maintenance, fast parts service, low initial and operating costs.

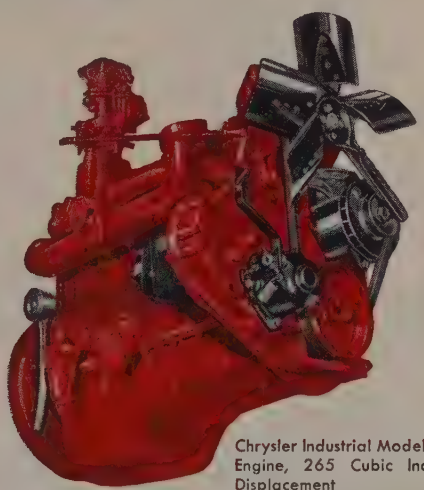
See the dealer nearest you, or write for complete information. ***Dept. 51, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

Open Power Units. The open power all engines include the complete skid base, radiator, instruments and nt panel, flywheel and flywheel Open power units for V-8 Models and 56 (pictured), include twenty- ion fuel tank.

Enclosed Power Units. The enclosed units have the complete engine, fuel odels Ind. 30, 31, 32 and 33— gallon. Models Ind. 52 and 56 ty-five gallon), storage battery, in- ts and instrument panel, flywheel, l housing, skid base and completely g sheet metal.



Chrysler Industrial Model 56 V8 Engine, 331 Cubic Inches Displacement (Front End Chain Drive)



Chrysler Industrial Model 33 Engine, 265 Cubic Inches Displacement (Front End Gear Drive)

al Equipment—Chrysler Engines

- Industrial Torque Converter
- gyrol Fluid Coupling
- our or Five-Speed Transmission
- or Twenty-four Volt Electrical
- e, Propane or Natural Gas Carburetor
- enter Clutch and Power Take-
- l or Horizontal Magnetos
- Coupling for Truck-Type
- shielding and Ignitors
- Duty Oil Bath Air Cleaners
- Switches (Low Oil Pressure, High Temperature)
- on or Fungus Resistant Electrical

GENERAL SPECIFICATIONS — ALL MODELS

	Ind. 30	Ind. 31	Ind. 32	Ind. 33	Ind. 52	Ind. 56
No. of Cylinders	6	6	6	6	8	8
Type of Engine—4 Cycle	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Bore—Inches	3¼	3¼	3⅞	3⅞	3⅞	3 13/16
Stroke—Inches	4⅝	4⅝	4¾	4¾	3¼	3⅝
Displacement—Cu. In.	230	230	265	265	270	331
Compression Ratio	7.0	7.0	6.8	6.8	7.5	7.5
Valves—Arrangement	L	L	L	L	Vee	Vee
Pistons—No. Rings	4	4	4	4	3	3
Crankshaft—Bearings	4	4	4	4	5	5
Camshaft Drive	Silent Chain	Gear	Silent Chain	Gear	Silent Chain	Silent Chain
Camshaft—Bearings	4	4	4	4	5	5
Crankshaft—Bearing Diameter	2½"	2½"	2½"	2½"	2⅜"	2½"
Lubrication—Type	Press.	Press.	Press.	Press.	Press.	Press.
Lubrication—Type Oil Pump	Rotor	Rotor	Rotor	Rotor	Rotor	Rotor
Lubrication—Oil Capacity Qts.	5	5	5	5	5	5
Ignition—Battery Type	Yes	Yes	Yes	Yes	Yes	Yes
Spark Plug—Size	14 mm	14 mm	14 mm	14 mm	14 mm	14 mm
Starting—Elec. Type	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt
Gen. Reg.—Full Voltage	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.
Gen. Reg.—Full Voltage and Current Control	Yes	Yes	Yes	Yes	Yes	Yes
Carburetor—Type	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft
Fuel Pump	Yes	Yes	Yes	Yes	Yes	Yes
Weight—Approx. (Lbs.)	575	610	740	760	591	845

Specifications subject to change without notice.

SEPOWER

CHRYSLER INDUSTRIAL ENGINES

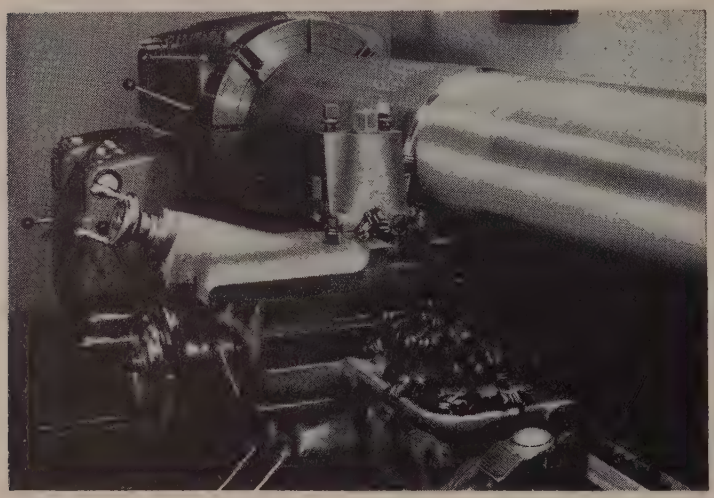
A PEDIGREE

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

NEW...ALL NEW!

FIRTHITE TXH

A heavy-duty, general purpose premium Carbide at no premium price



OUTSTANDING FEATURES OF TXH

- Higher hardness to strength ratio.
- Improved impact resistance.
- Wider range of applications.
- Cooler operating temperatures.
- Higher edge strength.
- Greater resistance to abrasion.

TXH is new, brand new, not just another grade designation for an altered existing grade. It is a completely new concept . . . a combination of materials and processes designed specifically to do heavy duty, high production cutting operations better than they have ever been done before. It does.

During development in Firth Sterling laboratories, FIRTHITE TXH *out-performed* and *out-lasted* all other *premium grades of carbide.* After thorough introduction in the field, performance has exceeded laboratory predictions in case after case.

Here is a premium quality carbide developed for an age of automation which, at no extra cost, out-performs and outlasts all others.

Available from stock now in all standard tips and tools. Try it *now* and *prove it yourself!*

FOR ENGINEERING SERVICE CALL YOUR NEAREST FIRTH STERLING REPRESENTATIVE

R 314

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

MILLS: McKEESPORT, TRAFFORD, DETROIT, HOUSTON

OFFICES AND WAREHOUSES*: BIRMINGHAM CHICAGO* CLEVELAND DAYTON DETROIT* HARTFORD* HOUSTON LOS ANGELES* NEW YORK PHILADELPHIA PITTSBURGH WASHINGTON WESTFIELD, N.J.

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels — Sintered Tungsten Carbides
Tool & Die Steels — Firth Heavy Metal
Stainless Specialties — Chromium Carbides
High Temperature Alloys — High Temperature Ceramics
Zirconium

FIRTH STERLING TRADE MARK

CALL YOUR FIRTH STERLING DISTRICT OFFICE OR DISTRIBUTOR. ASK MR. TOOLEY.

maker of winches, wrecker accessories and all-steel cabs for Jeeps, utility and truck bodies.

Baltimore Firm Expanding

G. & S. Wire & Iron Works, Baltimore, is adding 5000 sq ft of manufacturing space.

Continental Can To Build

Continental Can Co., New York, will build a plant in Sharonville, O., to double its can manufacturing facilities in the Cincinnati area. New products will include metal containers for beer, shortening and liquid detergents. The plant will be set up to take tin plate from the mills, do the necessary lithographing or lacquering, cut can ends and fabricate the finished containers.

Dings Buys Chicago Firm

Dings Magnetic Separator Co., Milwaukee, purchased Chisholm, Boyd & White Co., Chicago, maker of brick presses. An expansion and modernization program is planned for Chisholm's production facilities and offices.

Forms Mexican Subsidiary

National Supply Co., Pittsburgh, maker of oil field machinery, equipment and pipe, formed a Mexican subsidiary, National Supply Co. of Mexico, S.A., Mexico City. The organization will be managed locally by two vice presidents, E. M. Gretzler and J. M. Estrop. Sales to customers in Mexico will continue to be handled by National Supply's Export Division, with headquarters in New York.

Plans More Research Facilities

Armour Research Foundation of Illinois Institute of Technology, Chicago, has launched a $5-million building program. The expansion will make it one of the most complete industrial research centers in the world. Three buildings and substantial additions to two buildings will be constructed over the next ten years. New buildings and their completion dates: A $1.25-million physics and electrical en-

(*Please turn to page* 76)

3 New Norgren Air Line Filters REDUCE WEAR ON AIR-POWERED EQUIPMENT

New Sizes of Automatic-Drain Filters Added to Norgren Line

Automatic-drain filters for use with ¾" and 1" air lines are now being manufactured by Norgren in addition to their present models for use with ¼", ⅜" and ½" air lines. Three filter elements are available—of 74, 64, and 25 microns.

Norgren Automatic-Drain Air Line Filters filter oil, corrosive moisture, abrasive pipe scale, rust and other solids from compressed air. A float controlled, pilot operated drain mechanism, operating under constant or fluctuating line pressures with or without air flow, automatically drains collected liquids. For trouble-free operation and reduced wear, the solids are prevented from entering the drain mechanism.

Series 11,200
¼", ⅜", ½", ¾", 1"
Pipe Sizes

New Metal Bowl Filter for higher temperatures and pressures

A new model replaceable metal bowl air line filter has been added to the Norgren line. The metal bowl allows the filter to be used at temperatures from —40° to 300° F. and at pressures ranging up to 250 psi.

These filters are designed to create a strong centrifugal force that "wrings" a high percentage of moisture and oil from the air. A baffle traps liquids and solids in the Quiet Zone in the bottom of the bowl and prevents them from re-entering the air line. Three filter elements are available—of 74, 64, and 25 microns.

Series 12,200N
¼", ⅜" Pipe Sizes

New, Better, Low Cost Filter

Norgren is now manufacturing a new, low cost filter for applications where the removal of solids from the air is of primary importance. The replaceable bowl can easily be removed for cleaning or it can quickly be replaced if accidently damaged in use.

The filter part of the unit, a reinforced 200 mesh Monel wire screen or sintered metal filters of 64 and 25 microns, is easily removed for cleaning without removing the entire unit from the air line. There are no moving parts to wear out and the filter functions with a minimum of pressure drop.

Series 30AD
¼", ⅜" Pipe Sizes

There is a Norgren AIR LINE FILTER for every air line need.

C.A. Norgren CO.

3412 So. Elati, Englewood, Colo.

For complete information about Norgren Air Line Filters, phone your nearby Norgren Representative listed in your telephone directory—or WRITE FOR NEW No. 700 CATALOG.

PRESSURE REGULATORS • AIR LINE FILTERS • LUBRICATORS • AIR CONTROL VALVES

DEPENDABLE

extruded aluminum

- ALL SHAPES
  INCLUDING HOLLOWS
- ALLOYS 1100, 3003, 2014,
  2024, 6061, 6062, 6063

BOHN

DELIVERY . . .

n any quantity

pendable delivery helps eliminate lost
oduction time. Dependable delivery helps
aintain balanced inventory.
ually important, Bohn's quarter century of
minum extrusion experience assures
u top quality every shipment.

R DETAILED INFORMATION AND QUOTATIONS
L YOUR NEAREST BOHN SALES OFFICE OR WRITE OR WIRE . . .

HN ALUMINUM AND BRASS CORPORATION **Dept. 561**
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luminum and Brass Corporation

ES OFFICES: *Boston, Chicago, Cleveland, Dayton, Detroit, Indianapolis, waukee, Minneapolis, Moline, New York, Philadelphia, Rochester, St. Louis*

Because they are produced by *turning*, rather than by less accurate methods, Fischer brass and aluminum nuts set new standards of precision and quality that speed assembly operations . . . reduce costs. Uniformly accurate, Fischer nuts are tapped square with the face to Class 2 tolerances . . . countersunk on both sides . . . burrless . . . cleaned and degreased before delivery.

You pay no premium for Fischer *precision-turned* nuts . . . they're priced no higher than those made by less exact methods.

Prompt delivery of all standard types and sizes is assured by large factory stocks . . . "specials" can be produced quickly and economically.

HERE . . . take a look at precision

C-287-FS

Investigate the savings possible with Fischer turned nuts. Write today for Catalog No. 55.

Fischer
SPECIAL MFG. CO.
476 Morgan Street
Cincinnati 6, Ohio

TURNED NUTS
Fischer
SPECIAL MFG. CO.
CINCINNATI, OHIO
SINCE 1905

(Concluded from page 73)

gineering research building (und construction), 1956; a $1.5-millio chemistry research building, 195 a $1.4-million administration buil ing, 1966.

Orders Heat-Treating Furnace

R-S Furnace Co. Inc., Philade phia, has been awarded a contra to build two furnaces for solutio heat treating aluminum plates the Davenport, Iowa, Works Aluminum Co. of America under prime contract with the U. S. A Force. "The furnaces will be th largest of their kind in the wor and are expected to go into oper tion late in 1956," says S. M. Stole president of R-S Furnace Co.

Metal Parts Maker Expands

Donnelly Mfg. Co., manufactur of metal parts for the electroni industry, will move into a $300,0 plant being constructed in Wal ham, Mass., by Cabot, Cabot Forbes, Boston.

Fuller Co. Buys Sutorbilt

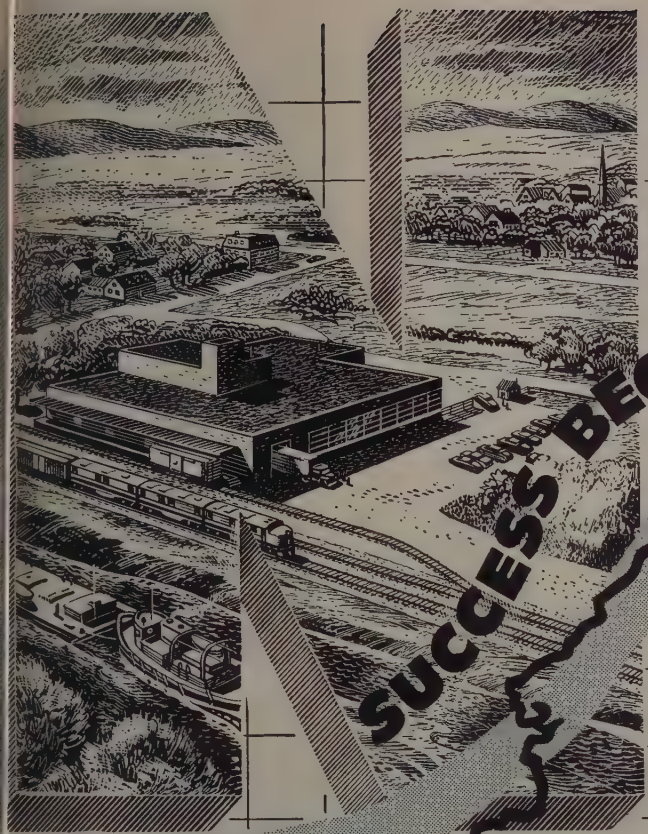
Fuller Co., Catasauqua, Pa., a quired Sutorbilt Corp., Los An geles, maker of pressure blower pneumatic conveyors, fans, mat rial feeders and related product Fuller Co. is a subsidiary of Ge eral American Transportatio Corp., Chicago.

Diamond Alkali Forms Two Uni

Diamond Alkali Co., Clevelan established an Electro Chemica Division (Frank Chrencik, gener manager) and a Soda Products D vision (H. B. Clark, general ma ager). Mr. Clark is succeeded a New York-New England branc sales manager by W. B. Beeson J

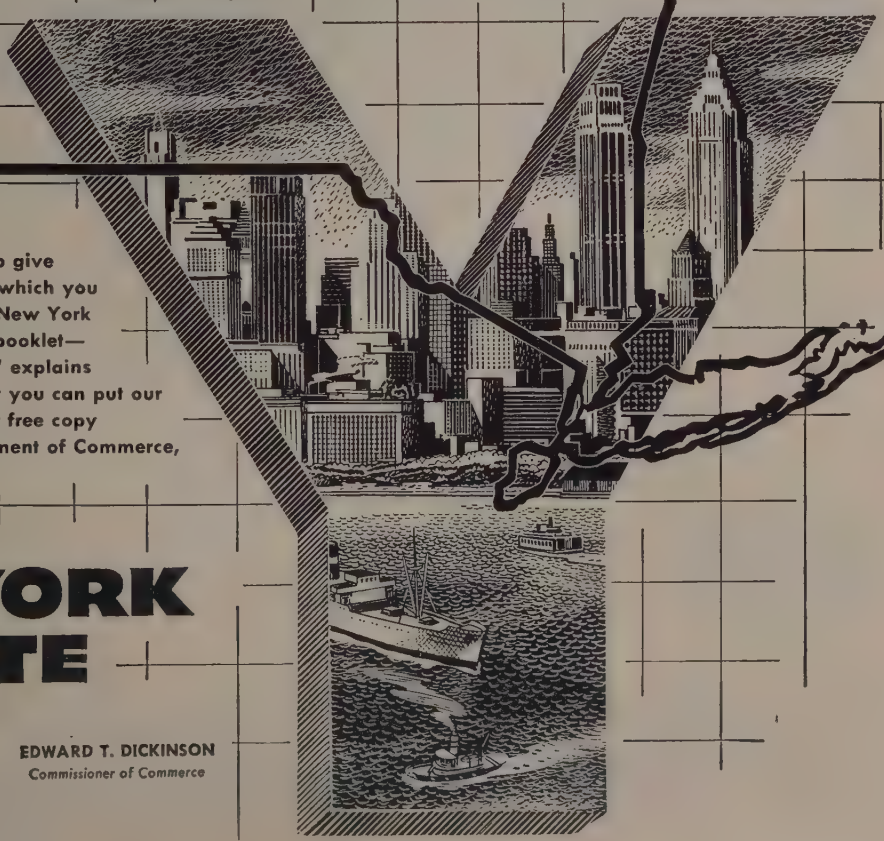
Superior Tube Building Plant

Superior Tube Co., Norristow Pa., is constructing a $500,0 plant and office building near i Wapakoneta, O., plant which th new facilities will replace. Sche uled for completion in Novembe the facility will increase Superior production of small tubing and ele tronic parts. As another phase o its expansion program, last sprin



SUCCESS BEGETS SUCCESS

Successful people buy more . . . successful people produce more. Where successful people are — there business flourishes. More successful people live and work in New York State than in any other. More industries — and a greater variety of industries — operate at a profit in New York State than in any other. Within the borders of the Empire State is the right location for your plant.



New York State is prepared to give you the particular FACTS on which you can decide exactly where in New York to locate YOUR PLANT. Our booklet— "Industrial Location Services" explains what we do, and shows how you can put our knowledge to work. For your free copy write New York State Department of Commerce, Albany 7, N. Y.

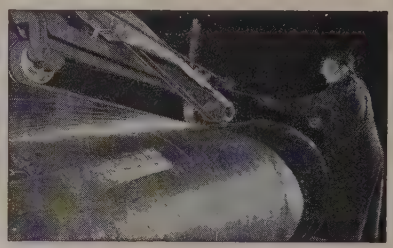
NEW YORK STATE

AVERELL HARRIMAN
Governor

EDWARD T. DICKINSON
Commissioner of Commerce

How would you SOLVE IT?

1 PRODUCTION PROBLEM: To speed production and cut costs of removing extra-thick weld seams from 2¾ ton industrial boiler drums. Drums are made of 1″ thick steel sections, welded together. Wickes Boiler Co. was using grinding wheels—found them slow, unsatisfactory.



2 SOLUTION: A 3M Representative suggested that this Saginaw, Michigan, manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on a swing grinder. Manufacturer found that each 3M belt removed these extra-heavy-duty welds faster, better.

3 RESULTS: An immediate production increase with much higher quality finishes. (Note: manufacturer experimented with a "Brand X" belt, found it averaged only 9 feet of weld per belt . . . 3M belt removed 30 feet!) A 3M Representative can help you solve your grinding and finishing problems, too. Call him today. There's no cost or obligation.

3M ABRASIVES

Made in U.S.A. by Minnesota Mining and Manufacturing Company. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing.

WANT MORE INFORMATION?

Minnesota Mining and Mfg. Co.
Dept. GJ-16, St. Paul 6, Minn.

☐ Send me free booklet: "Weld Grinding & Blending with 3M Abrasives"

☐ Please have 3M Representative call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

My Distributor is_____

3M

the firm acquired a majority interest in Johnson & Hoffman Co Mineola, Long Island, N. Y., manufacturer of precision stampings and deep drawn parts for the electronics industry.

ASSOCIATIONS

George A. Delaney, chief engineer, General Motors Corp.'s Pontiac Motor Division, was elected president of the **Society of Automotive Engineers**, New York. He succeeds C. G. A. Rosen, consulting engineer to the president Caterpillar Tractor Co., Peoria Ill. B. B. Bachman, Autocar Division, White Motor Co., Cleveland, continues as treasurer.

Wayne R. Archerd, assistant comptroller, Bethlehem Steel Co Bethlehem, Pa., was elected to membership in the **Controllers Institute of America**, New York.

REPRESENTATIVES

American Brass Co.'s American Metal Hose Division appointed two sales representatives: J. J. Moran St. Louis, and L. C. Pratt, Atlanta.

Adamas Carbide Corp., Kenilworth, N. J., appointed Todd Machinery Co., Salt Lake City, Utah agent for that area.

G. H. Bruggman Co., Baltimore was named representative for **Vanton Pump & Equipment Corp.** Hillside, N. J.

American Chain & Cable Co. Inc., Bridgeport, Conn., appointed W. J. Savage Co., Knoxville, Tenn., as distributor of wire rope produced by its Hazard Wire Rope Division.

Conoflow Corp., Philadelphia, appointed H. J. Hartz district manager in that city. W. E. Hagan is district sales engineer.

John A. Roeblings Sons Corp., Trenton, N. J., appointed Republic Supply Co. of California, Los Angeles, as distributor in California, Arizona and Nevada.

CARMET®

can solve *YOUR* *Wear-Resistance* problem

RAZOR DIE PARTS preformed of CARMET Sintered Carbide

● WHAT JOBS HAVE YOU for CARMET CARBIDES to do?

For maximum wear, save with Carmet—preformed to practically any shape or size! *Examples:* entire blanking die parts; inserts for drawing, heading, extruding and blanking dies; gauge and wear parts, pins, bushings, etc. They can be supplied *preformed*—with minimum grind stock allowed—or precision ground and ready for use. Let us work with you . . . send us your drawings and specifications for quotations.

● *Allegheny Ludlum Steel Corporation, Carmet Division, Wanda and Jarvis Avenues, Detroit 20, Mich.*

Write for Your Copy of the

CARMET CATALOG

Just out . . . 32 well-illustrated pages, containing data on all Carmet grades, and on Carmet blanks, tools, die sections, punches, draw die inserts, etc.; also special preforming to order.

● *Write for your copy.*

ADDRESS DEPT. S-732

For complete **MODERN** Tooling, call

Allegheny Ludlum

W&D 5837

AL® FINE TOOL STEELS SINCE 1854

new Danly Presses double

FOR A LEADIN

Individual Press Production Jumps From 100,000 to 230,000 Laminations Per Day

Not only did this leading motor manufacturer double lamination production by switching to new Danly Autofeed Presses, but the additional benefits of much longer die life and greatly reduced maintenance provided exceptional cost savings as well. With the installation of new Danly presses, carbide dies were made practical in this operation for the first time. Danly's extra-rugged, extra-precise construction assures these dies a life expectancy of nearly three years — 200,000,000 pieces.

Maintenance records were set, too. Since installation, five Danly Presses have produced more than a quarter-billion lamina without downtime other than for die design changes and routine maintenance. Further, only 20% of the time formerly needed to keep dies in shape is now required. At the same time, each die is working harder, producing more than twice as many parts per day in the new Danly Autofeed Presses.

Find out *why* Danly Presses set such outstanding performance records . . . consult a Danly press engineer on *your* press requirements. Compare Danly Presses against all other presses yourself . . . check the important Danly features listed at the right. Discover why Danly Presses mean increased production at lower cost. Write for the complete new catalog on Danly Autofeed Presses today.

It costs less to run a DANLY PRESS

lamination production

MOTOR MAKER

Compare for yourself

BEFORE YOU INVEST . . . BE SURE YOU GET ALL THESE FEATURES

1. Machine tool precision in manufacture and assembly plus adequate lubrication assure smoother operation, longer life.
2. Danly presses are delivered "run-in" tested. Assembly and operation in the Danly plant means fewer adjustments, faster installation.
3. Danly's cool-running clutch lasts longer. Herringbone type gears and anti-friction bearings on high speed shafts wear longer.
4. Extra-heavy construction reduces vibration and deflection. Dies last longer, presses stand up under severest duty.
5. Danly features completely automatic oil lubrication including slide gibs. Should any vital bearing not be sufficiently lubricated, safety switch stops press and indicates the source of trouble.
6. Performance records in the country's biggest stamping shops prove that Danly Presses require less maintenance, greatly reduce spare part needs.
7. Controls designed and built by the press manufacturer assure the user of undivided, one-source responsibility for control and press performance on the production line.

DANLY MACHINE SPECIALTIES, INC.

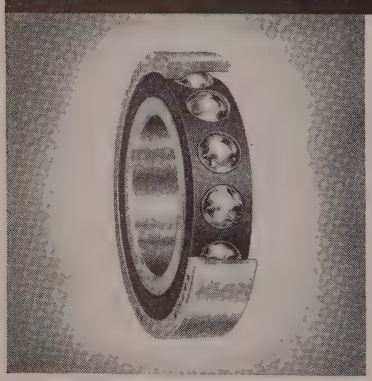
2100 South Laramie Avenue, Chicago 50, Illinois

DANLY

Looking for improved bearing performance?

over 14 billion revolutions...

– and still going strong



Fafnir Super-Precision MM201W1-CR spring-loaded ball bearing, the type specified for wheelhead illustrated.

Fafnir-equipped, high-speed, oscillating grinder wheelhead demonstrates machine tool progress in performance

This extraordinary record has been made on the production line by a Pope-built wheelhead, grinding the races of extra-precision ball bearings. The hi-frequency motorized wheelhead operates at 72,000 rpm. The motor is water-cooled and bearings lubricated by means of an oil-air mist system.

When designing this oscillating grinder wheelhead, Fafnir engineers worked together with the Pope Machinery Company engineers in the selection and application of bearings. The type of bearing recommended is shown at the left and its application in the drawing above. Its performance record, according to Pope, demonstrates progress to match today's improved machine tools.

Whatever your bearing problem, a few minutes spent with a Fafnir representative may be the means of solving it as successfully. Write The Fafnir Bearing Company, New Britain, Connecticut.

FAFNIR
BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

Technical Outlook

FELTED METALS—Metal fibers, developed by Armour Research Foundation, are being formed into sheets much in the manner that paper or felt is made. The rough fibers interlock mechanically, making a tough nondirectional material that is easily formed. A possible use is for reinforcing ceramics.

BRAZING FIRST—A series of high-nickel filler metals makes it possible to fabricate metal parts for high-temperature service by brazing—such as rocket and jet components. The brazing alloys have nearly the same mechanical properties, corrosion and oxidation resistance as the stainless and heat-resistant alloys they join. In many instances, the brazed joint becomes stronger than the parent metal. The alloys come in rod, powder, strip and washer form.

CHEAPER ENAMELING—A new treatment eliminates multiple chemical baths and prefiring operations in porcelain enameling aluminum. Alcoa calls it the R-100 process and says it's well suited to a continuous enameling process.

STRENGTH RESTORED—Titanium, like other metals, suffers loss of compressive yield strength after cold working in tension. To get 95 per cent of it back, says Rem-Cru, stress relieve anneal for 1 hour at 850 to 1000°F.

TRANSISTORS IN INDUSTRY—Look for many heat-sensitive applications for the youngest member of the electronics family. Phototransistors in series with standard transistors as amplifiers will detect metal hotter than 700°F. Steel tubing makers, latest to adopt them, find that transistors are more rugged than photoelectric cells. They use them to determine the length and wall thickness of tubing. Pipe rolled too thin is too long; rolled too thick, the pipe is too short. Transistor heat detectors placed in a regular series near the end of a tube mill operate lights that flash instant warnings of off-standard tubing lengths and wall thicknesses.

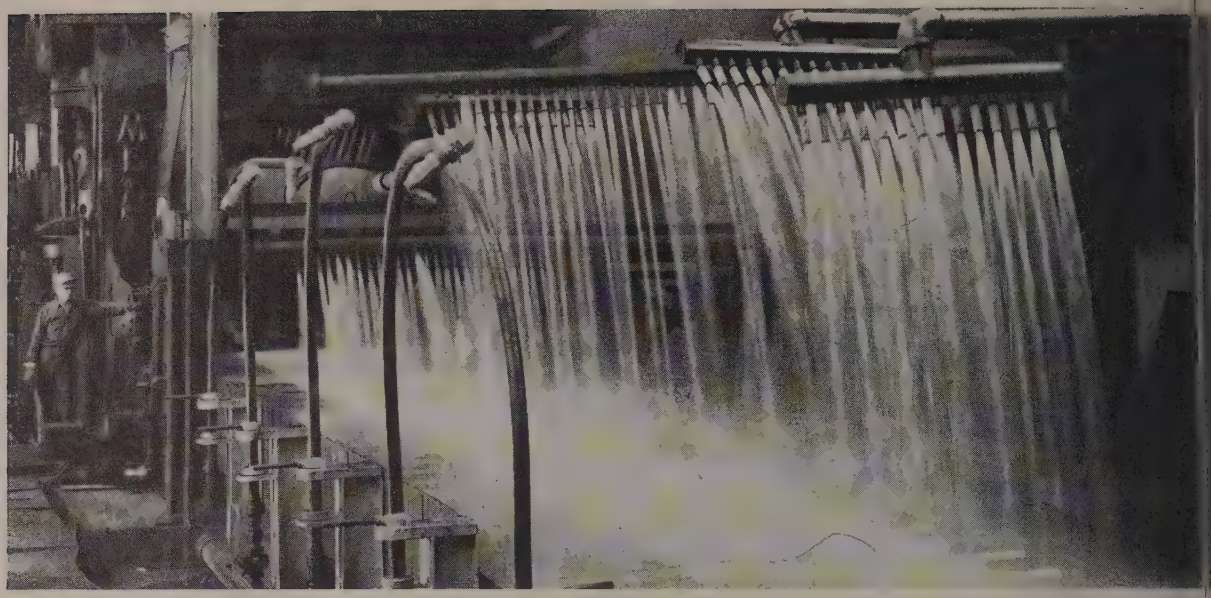
NEW DIE STEEL—Carpenter Steel Co. says it has developed a die steel for cold heading with a longer life. First showing will be at the ASTE exposition (Chicago, Mar. 19-23). Called H-9, its type analysis is: Carbon 0.90 per cent; mangenese, 0.40; and silicon, 0.40. It's a water quenching, deep-hardening alloy that gives a tough center because of a sound, uniform grain structure.

CAPACITOR PAPER—The Signal Corps reports results of its research on metallized paper capacitors: A comparison of electrode materials showed zinc far superior to aluminum.

BOTTLENECK—"Metallurgy is becoming the bottleneck for scientific progress in many fields," says Robert A. Lubker, Armour Research Foundation, Chicago. Alloys with low density and greater strength at elevated temperatures are needed. Mr. Lubker reports that the titanium alloy containing 6-per-cent aluminum and 4-per-cent vanadium developed at ARF is growing fast commercially. Reasons: Good creep strength and stability up to 1000° F, heat treatability for strength and toughness and more freedom from embrittlement.

SMELL TELLS—An inexpensive warning device will tell you when a bearing, boiler, generator, ball mill, clutch—even a coal pile—is too hot. A cartridge in a metal tube gives off heavy smoke and a pungent odor when heated above a preset temperature.

Metalworking Outlook—p. 33 Market Outlook—p. 119



Great Lak

Where does this valuable water go now? In the modern steel mill, as much as 90 per cent may be recirculated

More Work for Water

"Water is a natural resource which you can't own. All you can do is borrow it. As a borrower, the primary obligation is to return it in pretty much the same condition in which you got it."

William Neill
Columbus Metal Products Inc.

"Everyone is more and more water conscious. We want to put it back in a good condition, so as not to harm people downstream. Water is a precious commodity and must be treated properly."

G. A. Howell
Assistant to Chief Engineer, U. S. Steel Corp.

"Good management of water will dictate its increasing re-use within a plant and progressive control of contamination . . . by intelligent engineering to minimize and segregate contamination at each point of origin within the plant."

Everett P. Partridge
Director, Hall Laboratories Inc., Pittsburgh

METALWORKING is thirsty. It takes 60 tons of water to make a ton of pig iron, 100 tons to make a ton of steel, 8000 tons to make a ton of aluminum.

In some places there is serious competition for this water. As the Mahoning river moves past Youngstown, O., it is used seven times. Houston is pumping its wells so fast that the land is sinking. Even in the humid East, water is getting scarce enough to worry about. What is happening?

Dwindling Supply—In 1900 our 75-million people used 500 gallons of water per person each day. We had so much we threw it away. It didn't pay to do otherwise.

By 1950 the figure had jumpe to 1100 gallons, and the populatio had doubled. Our daily intake wa 180 billion gallons.

In 1956, just six years later, th number of users is up another 1 million. There isn't any mor water, but it has to go further Some places there isn't enough t go around.

Follow the Water—Where in dustry moves in the years ahea depends a lot on who has wate to offer. Communities and regiona water commissions are danglin inducements.

Akron, O., for instance, is ex tending a pipeline 11 miles north of the city. It will supply city water at the rate of 2-million gal lons per day. Its catch so far: An $85-million Chrysler Corp. plant, and probably one just as big for GM's Euclid Division.

With the largest supply of high grade fresh water in the world, the Great Lakes shoreline will continue to be an industrial magnet. An agreement with Canada (water taken from the lakes must be returned to their watersheds) limits

ewage plant effluent is undergoing eatment for industrial use. This may your next source of water

chemes to pump lake water far om the shoreline.

Wherever Found—It makes a t of difference where water omes from: Surface water (lakes, reams, reservoirs), ground water wells and springs) or municipal eated water. It comes in as many arieties as it has jobs to do.

Some plants will use water from everal sources because of differences in solids carried, mineral ontent, temperature, cost and a ozen other reasons. Where water uality is critical, as in plating, it ays to be where water requires minimum of treatment. Unortunately, industry doesn't often ave that freedom of choice.

When you can't move to the ater you want, you get interested schemes for making more water, r better water, economically here you are.

New Sources — Hydraulic engineers tell us there's a method for ailoring any water to any purose. This ability has opened up hat amounts to new sources for ater: Recirculation and sewage.

If you can use the water you ake into your plant over and over gain, replacing only that lost hrough evaporation, in effect you ave found a new source for ater. Of course, successive use hanges its quality. Re-use usually implies a sequence of downraded jobs, cleaning and cooling.

The Sparrows Point, Md., plant of Bethlehem Steel is using sewage plant effluent for cooling. Don't turn up your nose at the idea. This is treated water, cleaner than many a plant draws from a river. It's a relatively untapped major source.

Big Little Things — Hang a bucket on a dripping faucet and see how long it takes to collect a gallon. Multiply that by all the leaks in the plant and you'll be amazed by the water savings just a bit more care and good housekeeping will provide.

Another angle not well explored: What changes can you make in processing that will cut down on the volume of water needed, or the number of times it must be treated or cooled? You may find that water savings will richly repay the cost of revising manufacturing processes.

Sometimes the simplest answers are the most effective—like determining minimum necessary flow rates, and then closing a few valves part way. Or agitating rinses to help the water do a better job.

Gone to Waste—We've been prodigal long enough with our water, and the economic need for re-using it is bringing some unexpected benefits: Mill scale recovery from wash water in the steel industry, for example. The scale is premium ore for the sintering plants. It used to be dumped in the river.

Recirculating systems, by their nature, make it necessary to clean the water, thus capturing a lot of harmful substances that otherwise would have gone into sewers and streams. The good will this engenders (not to mention lawsuits avoided) is the sort of worthwhile dividend that can't be expressed in money. But it's real enough.

Treatment—With so much to be gained from recirculation and captured wastes, chances are that you'll be treating water soon in your own plant if you don't already. Among the things you can do are:

Remove dirt, bacteria, organic matter and other suspended solids.

Remove color, taste, odor.

Change alkalinity or acidity (control pH).

Soften.

Remove fluorides, silica.

Degassify.

Demineralize.

Hold metals in solution that would otherwise precipitate (sequestration).

Cool.

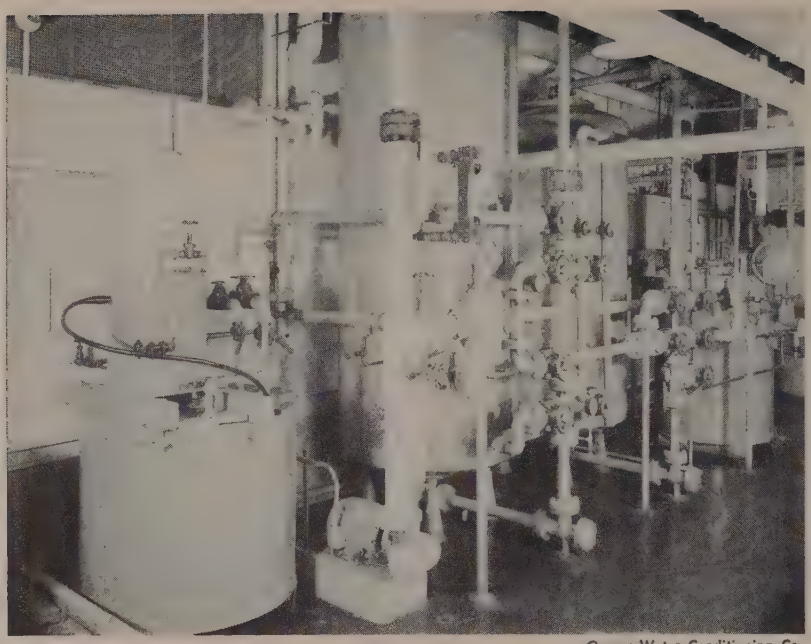
Space for water treatment is no longer a problem among moderate water users (for steel mills, it's a major problem). Modern equipment, particularly softeners, filters and ion-exchange demineralizers, is compact and highly efficient. In an old plant, the larger problem is likely to come from revamping the piping.

Write It Off — The water you use represents a sizable production cost. Do you know how much? In figuring the cost of water, says Everett P. Partridge, director of Hall Laboratories, consider these:

1. **Cost of getting it into the plant, either by purchasing municipal water, or developing your own surface or ground water supply.**
2. **Cost of treatment, such as clarification, filtration, softening, cooling, demineralization.**
3. **Cost of maintenance and replacement of equipment damaged by water through corrosion, deposits of scale or sludge and biological attack.**
4. **Cost of production losses through water shortages and water system down time.**
5. **Cost of damage to the product during processing, chargeable to water.**
6. **Cost of treatment and disposal of discarded water.**

Before you say "yes" or "no" to proposals for developing your own water sources, or for adding treating and recirculating equipment, ask the question: "What would it be worth to have water ideally suited to our needs, and to be immune from shortages, water damage and losses through waste?" That will give you an idea of what you can afford to pay. Then call in the water engineers and see what they can do.

The Other Fellow—Sometimes, the hunt for water brings disturbing problems, as when Boston goes out of its own watershed to tap water on the other side of the



Graver Water Conditioning Co.

Water treatment units don't have to be big. This ion exchange demineralizer handles 48 gpm

Berkshires, or when a heavily pumped well drains others dry. Then the courts have to step in to determine who owns what.

Such touchy situations put on the pressure for conservation, but enlightened companies aren't waiting for the pressure. Armco Steel Corp. at Middletown, O., with plenty of water, has just installed a clarifying and recirculating system.

It's an investment in good neighborliness. No one in the surrounding area will ever be short of water because of the plant's demands. The people down the Miami river will find the water cleaner than when it reached the plant.

Tell the World—If you have been able to accomplish things with water that are in the public interest, there's good reason not to hide the fact. Industry is still being given a black eye for its past excesses. What you can tell about your good works improves the community of public opinion for neighbors also.

Maybe water saving looks like a tug of war between economics and altruism, but don't be caught on the wrong side. Conservation is just as good economics for water as it is for oil or timber.

Back stream-flow regulation projects. Get interested in soil conservation, in schemes for returning groundwater to the ground. They mean more water for you tomorrow.

Making Plans—We consume 230 billion gallons a day in the U. S., and Army Engineers estimate that by 1975 the demand will be 400 billion gallons. How much will you need in 1975?

With just so much available and the demand zooming (don't forget the real competition of those extra bathrooms and air conditioning this is obviously the time to pl ways to make water stretch. So things are coming to help out.

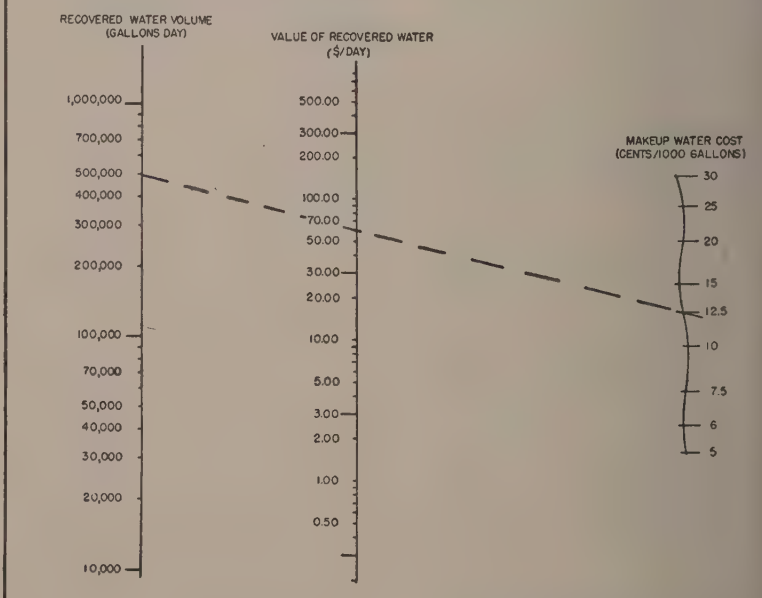
Bright Future — Cheaper tre ment is coming, particula through more efficient ion-e change resins. The method is or about 15 years old, has a lot growing to do.

Salt water, especially bracki water, is going to get a lot mo use. Today, it costs at least $1. to get the salt out of 1000 gallo It looks like vapor compression d tillation will be able to drive t cost below 60 cents for 1000 g lons. If it gets near 20 cents, t process will be economically a tractive. An ion-selective-me brane method already can des brackish water (one-ninth as sa as sea water) at that price.

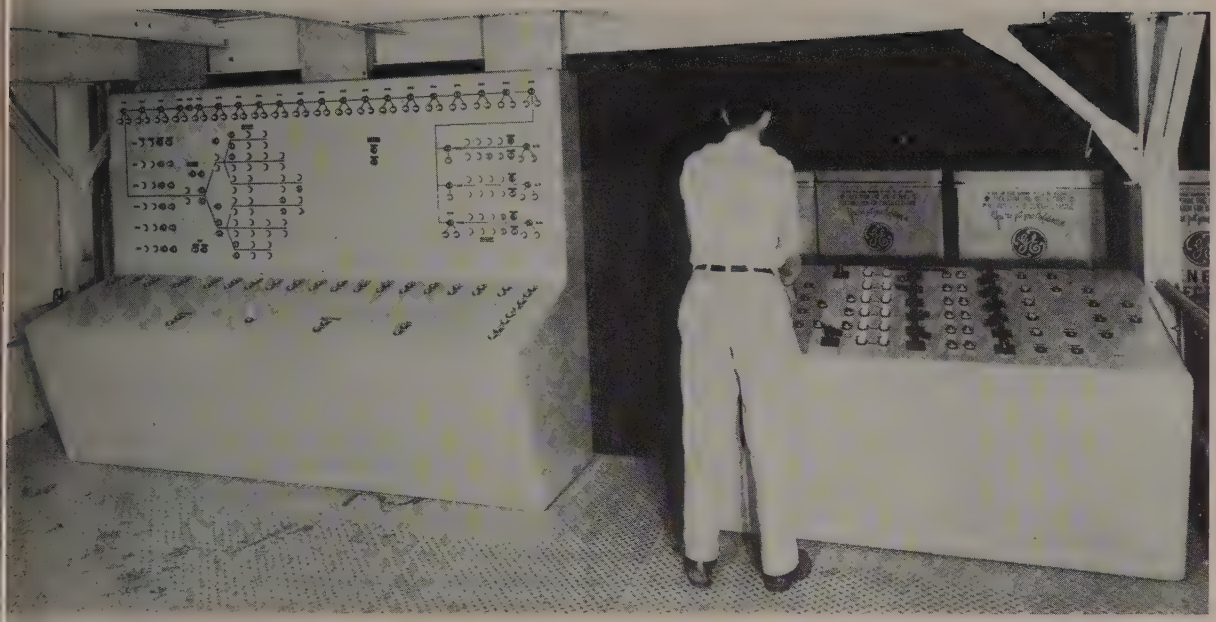
Don't expect much relief fr schemes to influence the weather cloud seeding, for instance. If y get water, someone else goes sho Instead, seek your supply close home, like the company that fou a source running to waste throu its air compressor cooling syste Heated by the compressors to 8 F, it now is used for rinsing.

• *Extra copies of this article, and a co panion article on waste to be publis next week, are available in quantities fr one to three until supply is exhaust Write Editorial Service, STEEL, Pen Bldg., Cleveland 13, O.*

What Recovered Water Saves



Source: Graver Water Conditioning Co.



This man and these two panels control 3000 ft of conveyor. Lights indicate trouble and locate it for troubleshooters. In some cases duplicate lights are connected to stand-by equipment as added insurance against equipment failure

A Lift for the Loading Dock

DOES IT MATTER how far shipping is from production? One man and an automated conveyor keep shipping humming more than half a mile away from the production line in GE's Appliance Park, Louisville.

If your shipping dock is distant and the road to it is crossed and recrossed by railroads, streets and superhighways, perhaps this solution will help.

Need—More space was needed to provide truck parking and turning and for automatic loading. None was available adjacent to the five main production buildings. The nearest convenient space was more than a half mile away.

An overhead conveyor, completely automatic and tied in with a signal and switching system, was the answer. It delivers appliances to the loading dock in banded, corrugated cartons, sorts them into product groups and either stores or loads them directly into truck trailers. The entire system is controlled from a central panel.

How It Works—The conveyor is a series of floor-type, roll-to-roll and chain-driven rolls in an overhead, enclosed trestle. Each group of rolls is independent of the others but an interlocking system prevents operation if the group ahead is blocked. Stoppages are indicated on the control panel by a warning light.

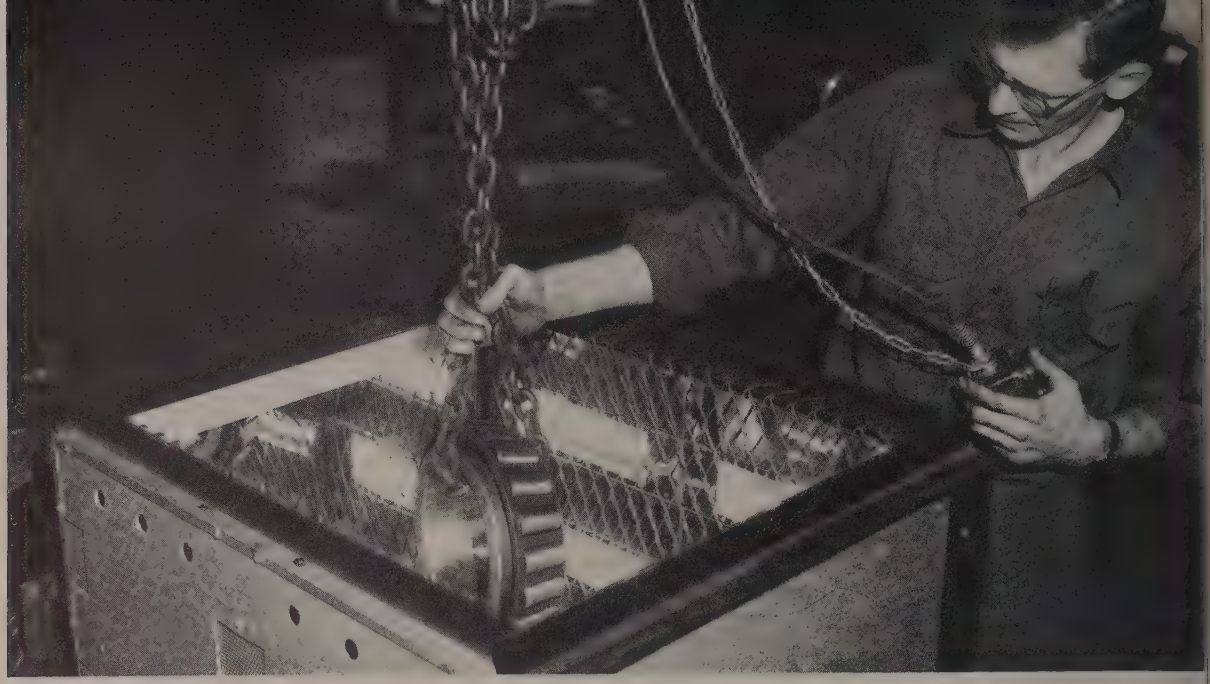
Six discharge lines will each receive 12 ft of cartons. Normally, a truck loads directly from the line. For short hauls and area storage, a fork truck can unload cartons from the side. Side unloading is used occasionally as rush-hour relief.

Routing—At the end of the production lines (the start of the conveyor system), appliances are arranged into trains of 24. Three makeup lines and a series of storage lines are used to feed the conveyor automatically. In case of trouble, storage and holding lines at both ends of the conveyor store the trains. When the difficulty is cleared, release is automatic.

At the end of the makeup lines, an automatic marker places a row of large, black coding spots on each train. Near the discharge end at the loading dock, photoelectric scanning devices pick up the spot coding and route the appliance to the correct discharge location. Manual switches and adjustments provide flexibility.

Conveyor — The main conveyor is a series of independent roller groups driven near the center. An indicating switch on the end of each roller of each group warns the control panel operator of trouble and its location.

Semitrailers are equipped with roller conveyors and a lift which tilts the trailer bed. The truck merely backs up to the loading conveyor, and the appliances roll in automatically. To unload, the truck operator tilts the bed and the appliances roll out.



Quartz infrared lamps bring bearing assemblies to temperature fast as . . .

Shrink Fitting Gets a Boost

By R. L. HENDERSON
Illuminating Engineer
Lamp Division, Nela Park
General Electric Co., Cleveland

THE PORTABLE OVEN above does a fast, efficient job of expanding bearing assemblies for fitting to heavy equipment at Wean Mfg. Co., Warren, O.

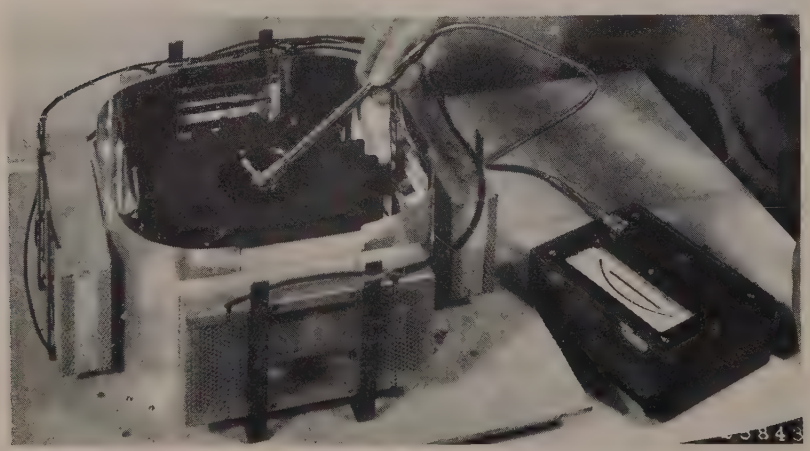
The company used to expand bearing assemblies and similar parts in a hot oil bath, or in a portable oven unit using regular infrared bulbs. The oil bath took too long to set up and run, and the portable oven wasn't roomy enough to take larger parts.

The Answer—Wean didn't want to increase the oven's size because that would make it too bulky to move. So it equipped the same size unit with twelve, 1000-watt quartz infrared tubes. Because of the small ness and high energy concentratio of these lamps, Wean can accon modate parts up to double the si it could before. The fitting jo can be done in the time it took set up the oil bath.

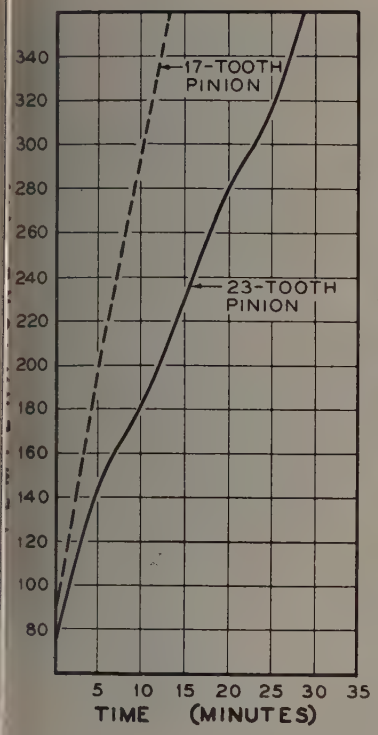
Gearing is getting a boost fro radiant heating, too. As pow demands increase, the torque c gears and shafts becomes greate To keep from increasing the si of these parts, machine builde are going to shrink fits to repla the keyed shaft.

Tests—Two Class A railroads e perimented with a test oven co taining four fixtures, each holdi two 500-watt, 115-120 volt quar lamps (see lower photo).

A 17-tooth, 38-lb pinion gear a a 23-tooth, 80-lb pinion gear, bot having tapered bores, were place in the oven at different time Starting with an ambient temper ture of 78°F, the 17-tooth gear w brought to 360° F in 15 minute The 23-tooth gear was brought t the same temperature in less tha 30 minutes.



This test oven has eight quartz lamps connected in parallel. It draws about 33 amps. Reflector material is Alzak; fixture base is transite



Time-temperature curve for two large gears heated in quartz infrared unit

Twenty-one tooth gears were heated by conventional methods and by radiant energy. The ambient temperature was 78° F at the start. In 22.5 minutes, the temperature of the gears heated by conventional methods was only 170° F. Gears heated by radiant energy were up to 322° F. All readings were taken inside the pinion bores. Temperature readings inside the bores in the infrared unit were uniform and skin effect was slight.

Other Uses—Infrared units are being used to bake motor armatures for annealing and paint baking. They are light (the test oven in the photo weighs only 30 lb) and can be operated on conventional 115-125 volt circuits.

They are flexible. Circuit connections can be made in series, series-parallel or parallel, depending on the available voltages and intensities desired. Shape or size of the unit an be altered.

These units are relatively inexpensive to build and operate. (The cost of the power used in heating the 21-tooth pinion gears was about $0.02.) They require little or no maintenance. The quartz lamp has a life in excess of 5000 hours if operated at rated voltages; it is also resistant to thermal shock.

Oblong bar of 4130 steel is cut round by ceramic tool without breaking or dulling. Original size of bar: 2⅝ x 3¾-in.

Ceramic Tool Outcuts Carbide

CERAMIC cutting tools may soon challenge carbides for high-speed cutting of high-strength materials.

Glenn L. Martin Co., Baltimore, has developed the tools for engine and turret lathes. Preliminary tests show the ceramics can effectively cut some steels that give carbides trouble. On normal steels and aluminum alloy, they outcut carbides in some cases.

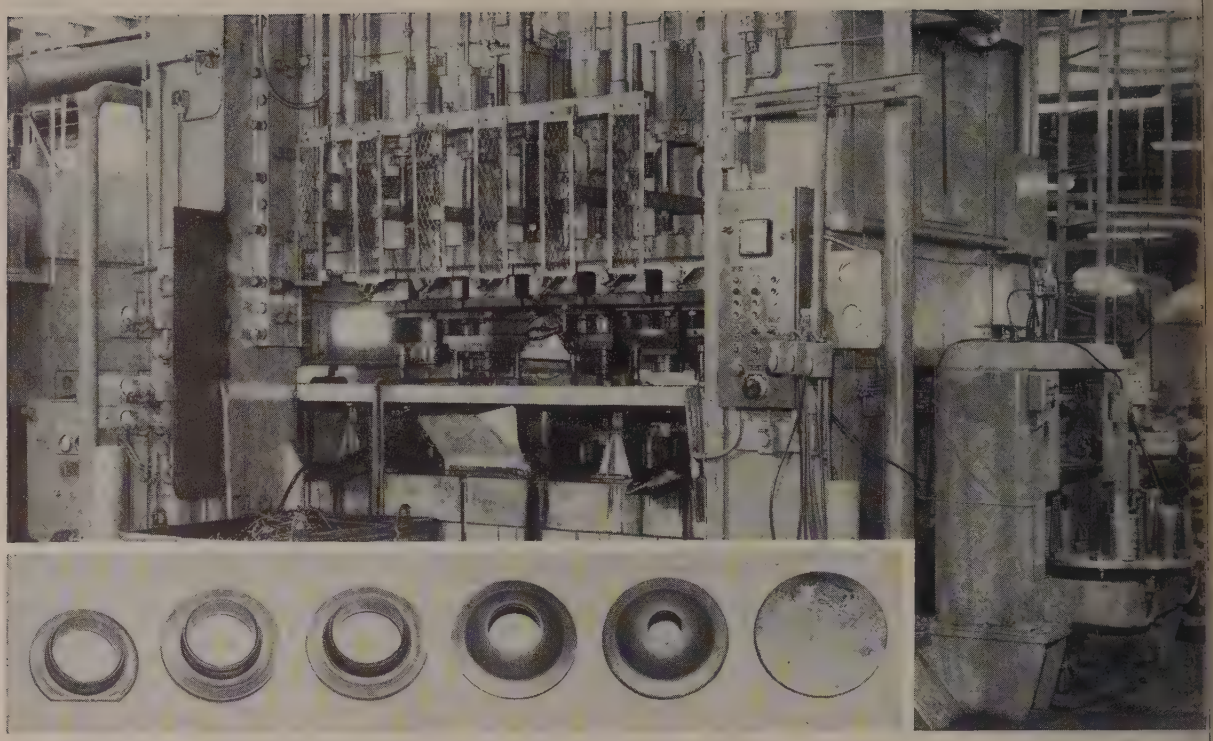
No Dulling—The ceramic tools cut heat-treated 4340 steel to a depth of 0.218-in. and knocked corners off square, hexagonal and oblong bars without breaking or dulling.

The ceramic was Alsimag 614, furnished by American Lava Corp., Chattanooga, Tenn. The tools were square and triangular.

The tests were intended to show that ceramics would cut high-strength steels under normal conditions. Complete evaluation of the tools—milling, drilling and other machining operations—is under way.

TEST RESULTS

Material	Bar diameter	Coolant	Rpm	Feed in. per rev.	Depth of cut	Sfpm
Steel 4340	1¾-in.	None	1480	0.010	0.187	680
Steel 4340 Rockwell C-52	2 in.	None	350	0.006	0.062	180
Steel 4340 Rockwell C-52	2 in.	Water soluble	160	0.007	0.218	80
INTERRUPTED CUTS						
Steel 4340	1½-in. hex.	None	464	0.010	0.125	180
Steel 4130	2 in. sq	None	302	0.010	0.125	226
Steel 4130	2⅝x3¾-in.	None	260	0.007	0.250	240



Flanges for Buick's rear-axle housings go through this press. A five-step die sequences parts (inset, from right to left) at a rate of 30 a minute

Package Plant in One Press

PRODUCTION MEN at Buick Division, GM, Flint, Mich., might well look on this transfer press as a plant within a plant. It turns out every rear-axle-housing flange that Buick uses.

Starting with a flat blank, the 1200-ton, six-station Verson Transmat jockeys the parts through five progressive steps and slides them out the opposite side at a 30-a-minute clip. One station (No. 4) is idle. It may be needed when the job is retooled.

Sequence—Blanks ($\frac{3}{8}$-in. thick, $5\frac{3}{4}$-in. OD) are magazine-fed to the press from the right-hand side. A transfer arm with pincerlike arms moves the blanks into the press and passes them from station to station.

Die sequence: Pierce a $1\frac{1}{4}$-in. hole and form the bell; repierce the hole; extrude the flange with a carbide punch; size and restrike (this, too, will be carbide); and trim to finish the flange.

Flanges come out of the press and move into a wash and dry machine

On the Line—The transfer bar shuttles parts out of the press onto a conveyor line that takes them through a Centri-Spray unit for washing and drying.

A belt conveyor then takes the flanges past a line of four weldin machines. Gates can be opened o the conveyor to shuttle flanges t any of the welders, or the flange can travel to the end of the con veyor where they're collected fo storage.

REVERE

Extruded Shapes give HUBER 5 GREAT ADVANTAGES

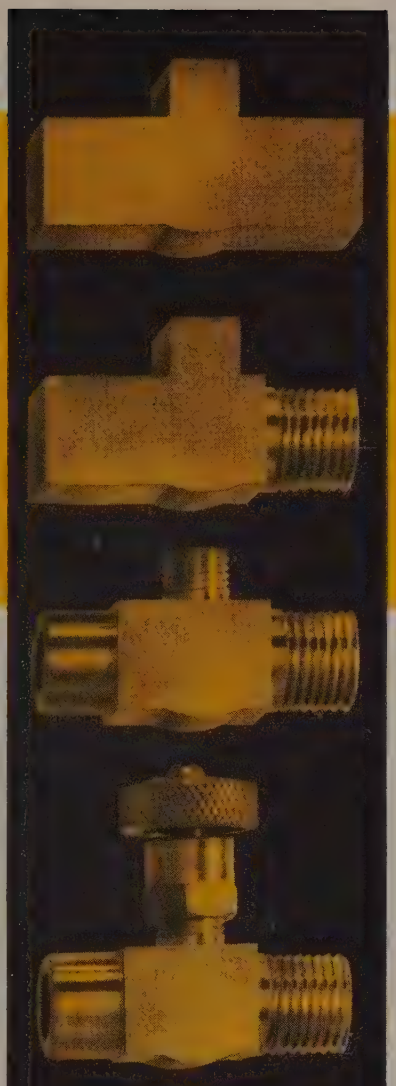
—they can do as much for you

This is the story of a Brazing Torch valve body, made by Huber Industries, Cincinnati 38, Ohio, chiefly out of a brass extruded shape furnished by Revere. As a result of experience Huber has become an outspoken advocate of shapes. Here are the five advantages Huber has found:

1. Machining time reduced 50%.
2. Uniform dimensions mean only one machine set-up for each operation.
3. No rejects whatever. Testing completely eliminated.
4. Uniformity of metal means minimum wear on tools.
5. Buy slugs cut to length, eliminating cutting-off.

The only part of this valve not of brass is the stainless steel conical valve stem.

An extruded shape costs more per pound than standard rod or bar, but the reductions in machining, finishing and other costs much more than make up the difference, and you save money. If you are machining copper and copper-base alloys, or aluminum alloys, get in touch with Revere and learn the advantages of extruded shapes.



Progressive steps in producing valve, beginning with the shape as supplied, cut to length.

Huber Type 100, Model A Brazing Torch.

REVERE

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Mills: Baltimore, Md.; Brooklyn, N. Y.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Newport, Ark.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

"The Revere Four-Way Service" is a 16mm sound motion picture in color, educational and informative. If you haven't seen it, write nearest Revere Office.

Torch cuts through stool end of a 6-ton ingot 30 in. in diameter. Note elevated tracks along which carriage moves longitudinally

Hot Cropping for Top Ingot Yield

HOT CROPPING of corrugated ingots with a custom flame-cutting installation speeds the preparation of steel for further processing at the Barberton (O.) works of Babcock & Wilcox Co.

The company produces ingots, 18 to 50 in. in diameter, chiefly for making long, heavy-walled tubes which are processed into cylindrical shapes for pressure vessels, gears, power-house components and other high-alloy products.

B & W uses a heavy-duty cutting torch and motorized arm mounted on an Airco No. 41 Radiagraph. The torch carriage moves longitudinally along an elevated track to allow positioning of the torch over the hot top of the ingot, then over the stool end (see photo).

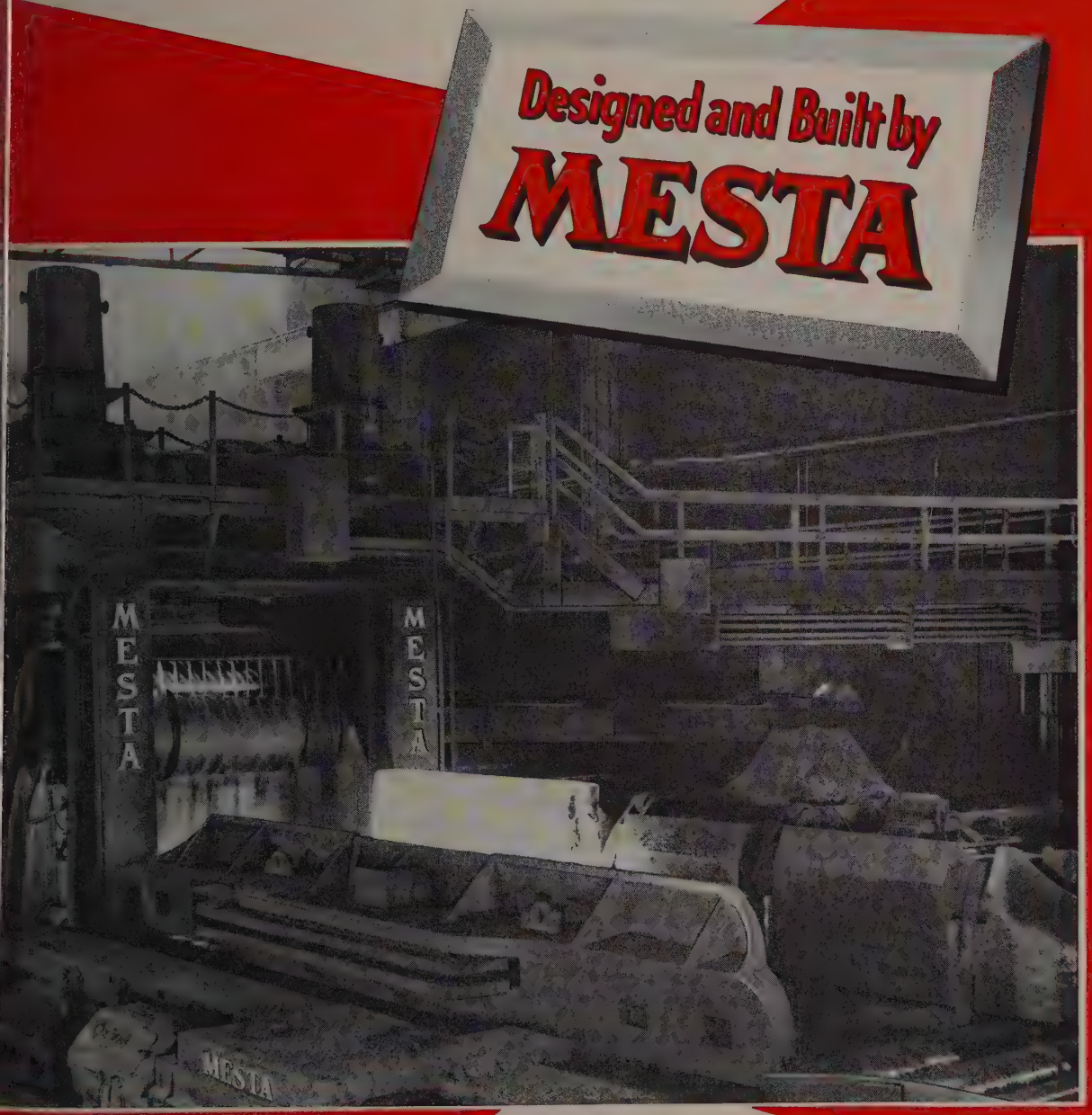
Benefits—Cropping of both ends means that only the usable metal is processed. Cropping at high temperature avoids the metallurgical problems of oxygen cutting the high-alloy steels.

Elimination of reheating operations is particularly important in the case of the high-carbon and alloy steels that normally require preheating prior to cutting. Besides the time and labor saved, B & W gets a maximum yield of fine steel products from the ingot.

Procedure — A crane places the hot ingot on V-blocks under the torch, with each end of the ingot extending beyond the blocks for a full cut. The supporting carriage for the cutting equipment is power driven to location and locked in position when cutting.

The radiagraph, made by Air Reduction Sales Co., New York, affords transverse movement for the torch as it makes the cut across the ingot. Cutting speeds average 2 ipm. The motorized torch arm permits raising and lowering of the torch as it moves across the various surfaces of the ingot.

SLABBING-BLOOMING MILLS



a 46" Reversing Slabbing-Blooming Mill, Tables and Manipulators

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These are examples of an easy, low-cost way to measure the final tension in screws and nuts. Used like an ordinary screw driver, they are best in crowded locations

How Much Twist?

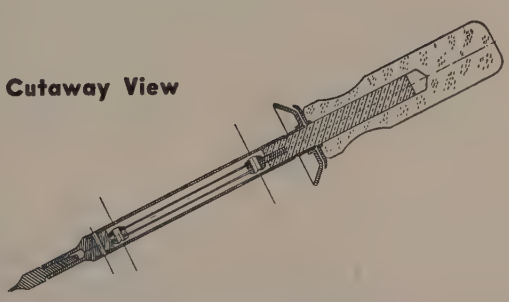
MEASURING torque in a screw is necessary if you're to get the most out of it. One of the best ways to do it is with a torque screw driver.

The tool uses from one to three steel blades to transmit twist from the handle to the screw. As the correct torque is approached, the steel torsion blade twists. The amount of twist is indicated by a pointer and a dial graduated in inch grams, ounces or pounds.

Tubing—Apco Mossberg uses ordinary 1015 carbon, Superior Steel tubing to enclose the torsion bars and hold the dial firmly to the bit. Commercial tolerances for 9/16-OD tubing (plus 0.000, minus 0.005-in.) permit a snug fit without machining.

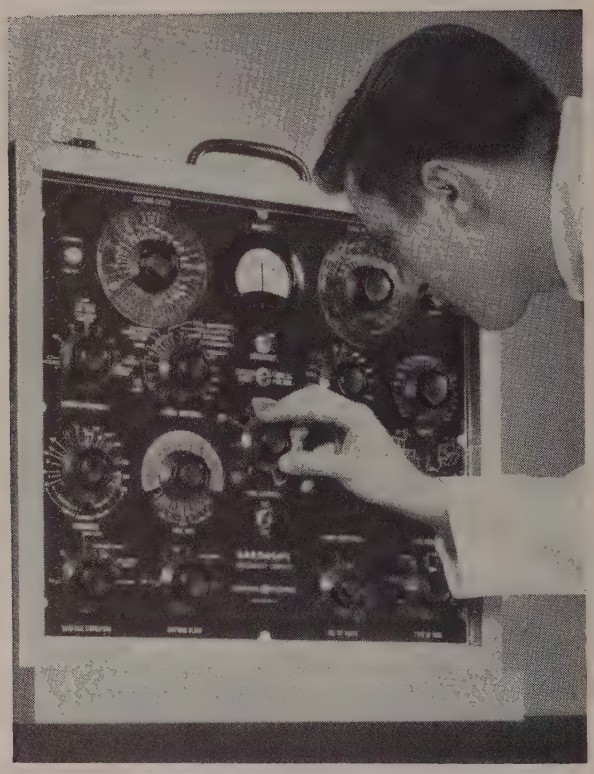
The dial holds still during twisting. The torsion blades twist (and transmit the torque) inside and without touching the outside tube.

Also known as vertical torque tools, they are used like an ordinary screw driver and provide easy access to screws through narrow openings. Inspection departments find them indispensable in checking the accuracy of automatic, power-driven screw drivers.

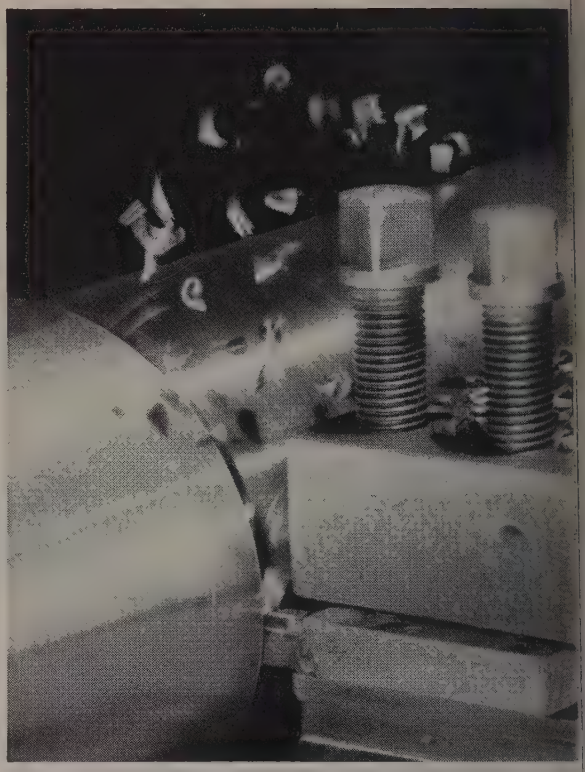


Two torsion bars are shown inside the tube casing. The handle and blades twist inside the tube

FOUR POSITIVE STEPS YOU
METAL AT THE LOWEST



Carboloy Machinability Computer accurately determines most efficient setup conditions.



Carboloy Grades 350 and 370 cut faster, wear longer. (Picture taken at 1/1000 second).

1 **Solve machining problems with the new Carboloy® Machinability Computer,** and you'll cut out hours of nonproductive setup time, and eliminate wasteful tryout runs. Faster, more accurately than any other method, the Computer determines the most efficient operating conditions for both simple and complex jobs.

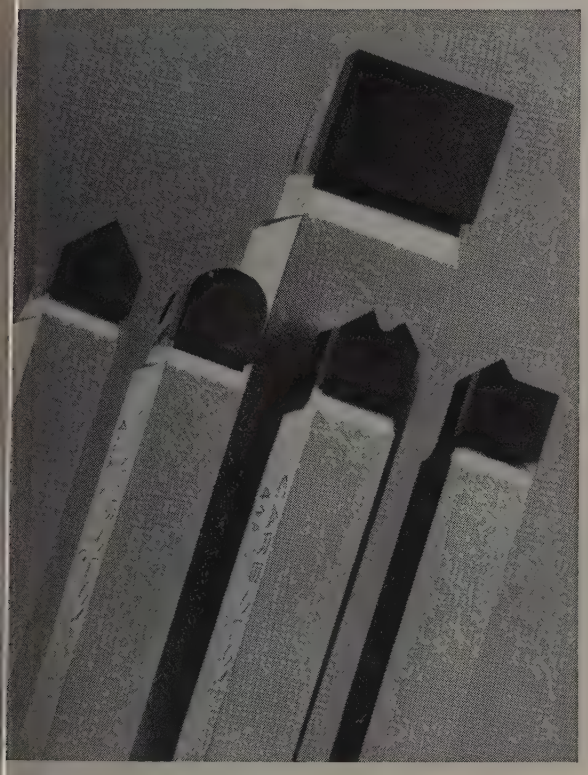
In seconds, it calculates the effect of the 19 most critical machining variables on the material to be cut, the cutting tool, and the cutting conditions. It shows how to set up optimum cutting conditions the first time a job is run, as well as how to improve existing setups. Price of the Computer is $495, f.o.b. Detroit.

2 **Cut steel with Carboloy® Grades 350 and 370,** and you'll increase production while reducing downtime and tool costs. Hundreds of in-plant comparison tests have proved these grades greatly outperform conventional carbides . . . providing the lowest tool-cost-per-piece of any carbide on the market today.

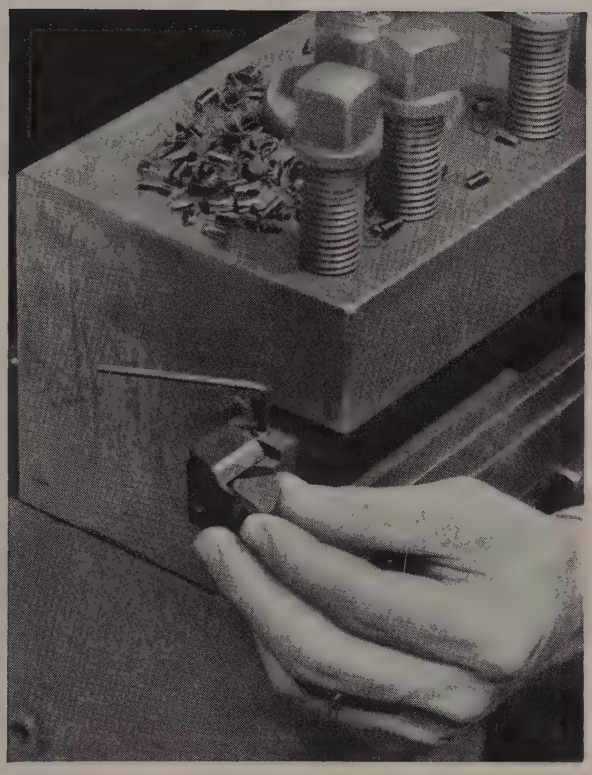
There are no "equivalent grades" for Carboloy 350 and 370, because these grades have a built-in structural rigidity that enables them to take deeper, more punishing cuts without the edge deformation encountered in other carbides. They will cut faster, wear longer, and get more production from your existing machine tools.

Consistent use of these Carboloy products will help you get maximum output from your machine tools . . . at lowest possible cost. For more information and tooling assistance, contact your local Authorized Carboloy Distributor (listed in the Yellow Pages of your phone book), or your Carboloy Representative.

CAN TAKE NOW TO CUT POSSIBLE COST



Style C Standard Carboloy Tool and typical special shapes quickly adaptable from it.



New Carboloy Toolholders can be indexed quickly, easily . . . right in the machine.

3 Apply Standard Carboloy Tools wherever possible, and you'll eliminate many higher cost "specials," while reducing over-all single-point tool inventories by as much as 30%. By standardizing, you will be using only 13 basic styles —"as is," or ground to special shapes — on up to 80% of your setups where braze-type tooling is used.

There are no inventory problems when you use "standards." These versatile tools are stocked in grades to handle any job from roughing to finishing on metals or nonmetals. You can get immediate delivery and tooling assistance from your local Authorized Carboloy Distributor.

4 Make maximum use of the new, easier-to-use Carboloy Toolholders, and you'll reduce tool-change time and lower insert costs. These holders employ a special clamping device combined with a carbide chipbreaker, which makes it possible to index a blank rapidly and accurately without removing the holder from the machine.

In addition, they utilize a shock-absorbent pad beneath the cutting blank, to permit the use of thinner, more economical inserts at increased speeds and feeds. And, because they are versatile, precision tools, they can be quickly adapted to many jobs you are now forced to tool with costly "specials."

CARBOLOY

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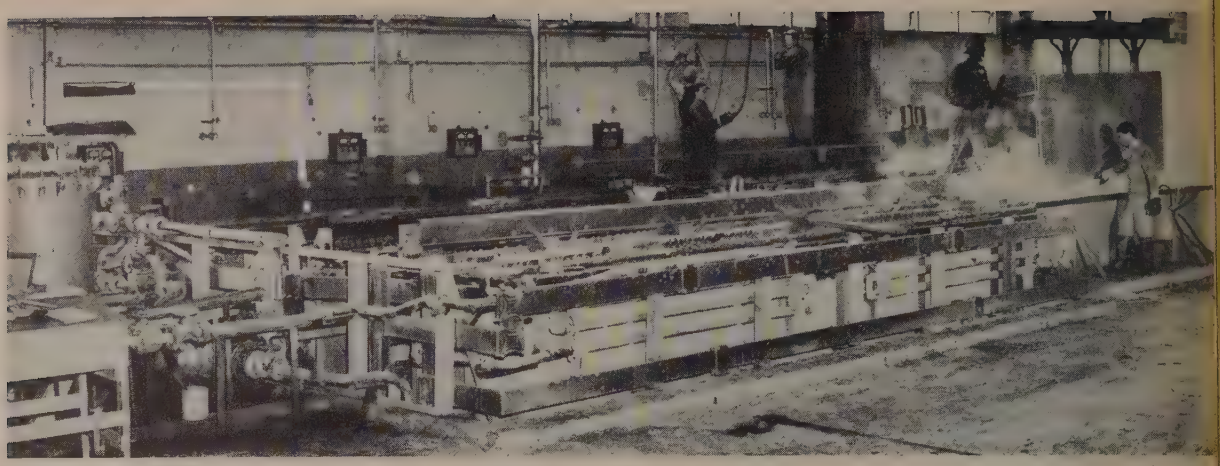


Sheet and plate electrocladding at Bart Mfg. Corp., Belleville, N. J. These are the cleaning, plating and porosity testing tanks

Plating Pit-Free, Heavy Nickel

By DR. PAUL H. MARGULIES
Director of Technical Information
Becco Chemical Division
Food Machinery and Chemical Corp.
Buffalo

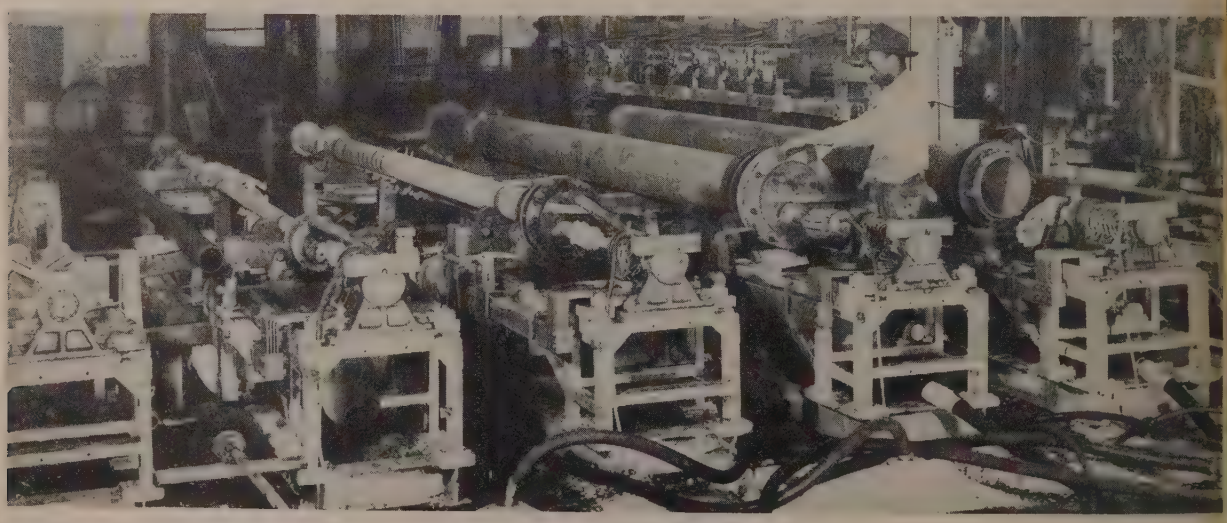
FOR WEAR and corrosion resistance, heavy nickel plate finds an increasingly important role. It must be pit free to be effective, but the ordinary wetting agents won't always prevent pitting while plating these dense, hard coatings. Then is the time to try hydrogen peroxide (H_2O_2).

Small amounts of H_2O_2 added to the plating bath will prevent pitting: Compounds which are partly responsible for pit formation oxidize and precipitate, instead of adhering to the work surface.

H_2O_2 will also reduce hydrogen bubble formation because the hydrogen is oxidized to water.

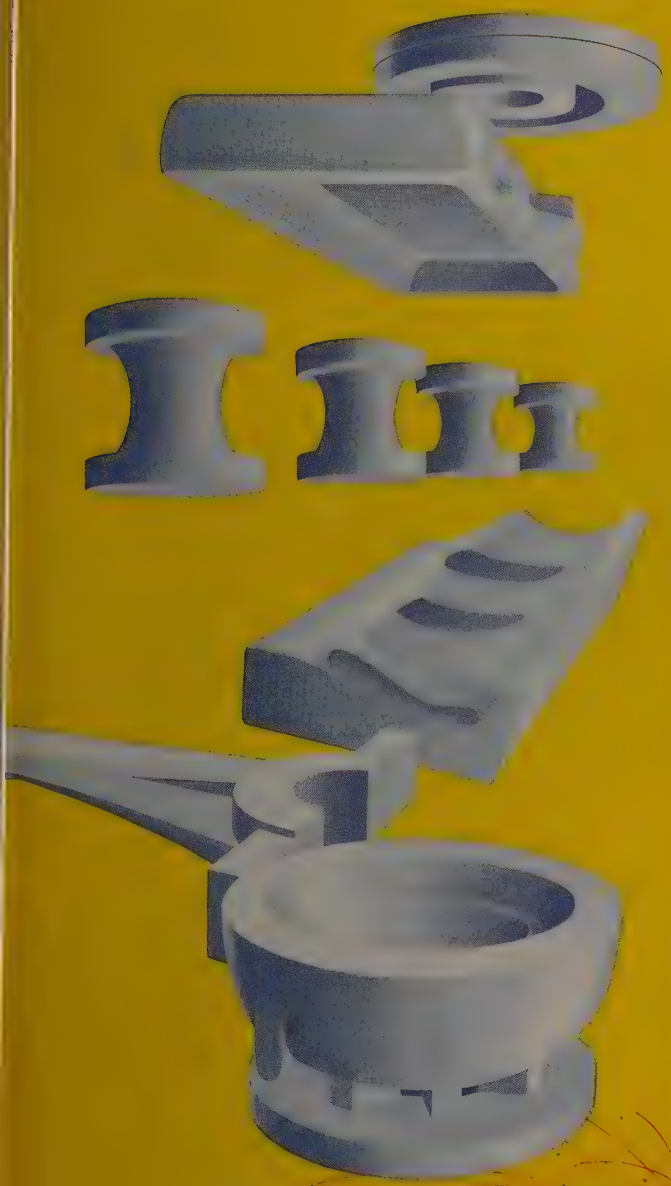
How Much?—One to two pints of H_2O_2 (35 per cent) are added to every 1000 gallons of plating bath each 8-hour working day. It is preferably added in six to eight small portions during the working time of the bath, and should be properly distributed.

In installations which continuously filter the bath, it is possible to feed H_2O_2 into the return



Racking and plating setup used at Bart Mfg. Corp. to internally nickel plate pipe from 1½ in. to 18 in. ID

You save time and money with fine JESSOP cast-to-shape steels



If you employ the use of dies, forming tools, gauges, cams, rolls, or numerous other similar products, you'll find you save time and money by having these tool steel requirements cast-to-shape by *Jessop*. *Play us on your team*, and discover that the tool steel shapes we ship to you answer your most exacting physical and metallurgical needs and necessitate, at the most, a bare minimum of finishing. Also, you will come to know that doing business with the Cast-To-Shape Division of *progressive, fast-growing Jessop* is a pleasant, as well as profitable, experience. There are no *neophytes* or *complacent* steel men here. In the foundry, the laboratory, and the research department are highly-skilled men who take pride in their work. They get *good* customers and *keep* them by turning out sound, uniform, close-tolerance castings quickly. Become a *Jessop* customer, yourself, and find out.

STAINLESS STEELS • HIGH SPEED STEELS • NON-MAGNETIC STEELS • HIGH SPEED TOOL BITS • HEAT RESISTING STEELS • STAINLESS-CLAD PLATES CARBON AND ALLOY STEELS • TOOL STEELS FOR SPECIAL PURPOSES CAST-TO-SHAPE TOOL STEELS • HIGH SPEED AND ALLOY SAW STEELS TEMPERED AND GROUND STRIP STEEL • COMPOSITE HIGH SPEED STEELS STAINLESS AND HEAT RESISTING CASTINGS • COMPOSITE DIE STEEL SECTIONS • PRECISION GROUND FLAT STOCK DIE STEELS—HOT AND COLD WORK

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e from the filter to the plating nk. In other installations, H_2O_2 added directly to the tank after uting it with an ample portion the plating bath. The diluted ution should then be added by ng a pipe extending well into e bath.

Another way would be to use a stic pipe, closed at the lower d and provided with small holes ar the lower end and with a nnel at the top. If the diluted drogen peroxide solution is wly poured into the funnel ile the submerged end of the pe is moved along the plating nk, good distribution will be as-red.

Watch Iron — Iron compounds ould not be allowed to precipi-te in the plating tank since they ill cause roughness on the work. stead, they should be precipi-ted in a separate tank and col-cted on a filter before the solu-on is returned to the plating nk.

One user of hydrogen peroxide r nickel plating is the Bart Mfg. orp., Belleville, N. J. The Lectro-lad process developed by this ompany makes a strongly adher-nt, ductile, pore-free, nickel-clad aterial which is economical to se for the control of contamina-ion and corrosion.

The process is used to apply ickel on steel plate in thicknesses rom 0.006 to 0.020-in., the thick-ess of the coating not being af-ected by the thickness of the teel. It fills a gap created by roll ladding in which 5-per-cent nick-l is not available on plates less han ½-in. thick.

Deposit Rate — In the plating ath, nickel is deposited at the ate of 0.003 to 0.005-in. an hour. t can be deposited faster, but this s the optimum rate which will roduce a smooth and pore-free urface. The solution is a modified Watts type, operated at 145 to 155° F. Metal concentration is kept at a high level to permit op-eration at higher current densities, yet assure uniform metal distribu-tion.

Quality Control—Rigid steel se-lection, solution maintenance and postplating inspection are the keys to uniform quality.

The solution is chemically controlled daily for pH, nickel sulphate, chloride and surface tension. It is purified at high pH with Becco hydrogen peroxide at frequent intervals to precipitate foreign metals and contamination, particularly iron which builds up in the solution. It is also continuously purified by low-current density plating to remove copper and other impurities.

Check Up—Following final rinsing, plates are immersed in an aerated hot water bath at 180° F for 30 minutes, as a porosity test. In that time, even tiny pores in the clad surface will show discoloration that can be a cause for rejection.

Adherence of the nickel is determined through a flame test. The plated steel is heated to a temperature above 1200° F at several points with a torch and then examined for blistering.

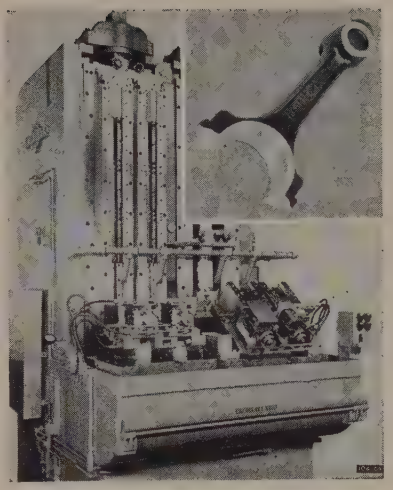
In addition to the plate tests, sampling tabs are welded to each rack. These are tested for porosity, ductility and hardness. Micrographic analyses are also made periodically on sections sheared from plates.

Uses—Heavy nickel plate is important in electroforming, in building up slightly worn parts of machinery, in making electrotypes and in giving heavy tubing corrosion protection for severe service conditions.

Steel plates clad by electroplating on one side range from 3/16 to 2 in. thick, 18 to 84 in. wide, and 60 to 240 in. long. Sheet, clad on one side, ranges from 7 to 14 gage, with the same width and length range as plate. Sheet is generally clad with 0.006 to 0.008-in. of nickel. Cladding on plate is 0.008 to 0.010-in. thick, with a maximum of 0.020-in.

The process is also applicable to pipes and fittings of low carbon steel. Piping systems lined with corrosion-resistant material and meeting all conditions of the ASTM code for pressure welding are possible.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



Tilting Broach

A TILTING fixture speeds broaching by providing easier loading, more accurate positioning and improved operator safety. One automotive manufacturer is getting 550 connecting rods an hour on one machine and 27,000 pieces for each broach sharpening.

Operation—During loading, the machine table is in the full rear position with the fixture tilted back toward the operator about 45 degrees. The tilt permits the two connecting rods to fall automatically into the correct position under locators.

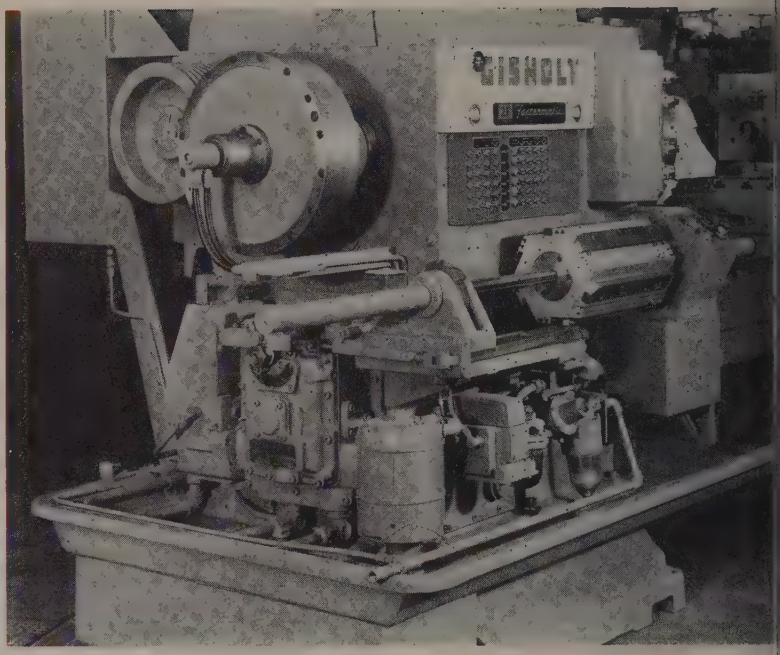
To start the cycle, the operator pushes two overhead palm buttons. Clamps close and start the machine table forward. A roller bearing in a track cam tilts the fixture forward into the correct cutting position. Limit switches actuate the ram for the cutting stroke.

At the end of the cutting stroke, the cycle is reversed, and spring ejectors push the parts into a finger-clear space.

Dual Setup—Duplicate fixtures enable an operator to unload and load one fixture while the other is in broaching position.

The fixture base and tilting trunnion plate, including locators, hydraulic clamps and spring ejectors, are mounted on the broaching machine table. Both plate and base are aligned by four, hardened, vee locators which compensate for the clearance required at the pivot pin. Maker is Colonial Broach & Machine Co., Detroit.

Molded resin panels for housings show . . .



Before installation of housings

What Plastics Can I

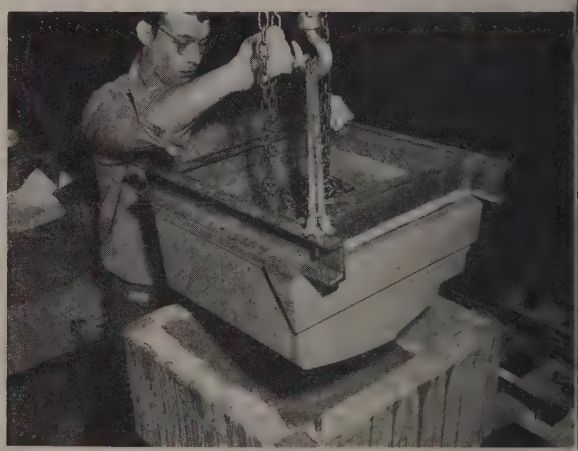
SEVEN PIECES of fiberglass reinforced plastic are the difference in the before and after look of the new machine tool (above) moving down the assembly line at Gisholt Machine Co., Madison, Wis.

Stronger than steel, pound for pound, the lightweight plastic panel housings are simply b toned, latched or snapped in pl For the machine tool user, th easily handled plastic panels m less down time and work maintenance and repair.

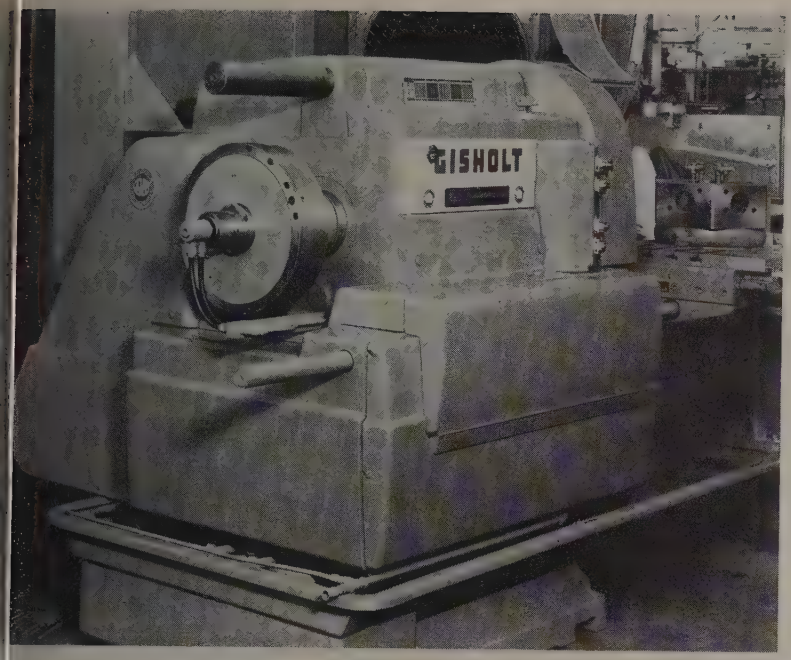
The user also gets plusses durability: The plastic res

Making Plastic Parts at Gisholt

Plastic mold is gel coated before fiberglass is laid. This gives plastic parts a homogeneous, smooth surface



Plastic plug goes into mold after fiberglass mat and r have been laid up. It's clamped into place



ere's the machine with plastic panels

or Machine Tools

rasion from flying chips or shav-gs. It is not damaged by acids, rease, oils or most chemicals used ith machine tools. It doesn't arp or change shape. Its elec-ical characteristics are good, as mechanical strength. And it self extinguishing.

Other Side—For the machine tool builder, molded fiberglass plastic shapes (panels, dials, covers, guards, housings, etc.) are cheaper than the same parts fabricated from metal.

A cast iron housing panel for one of Gisholt's machines costs around $160; it weighs 400 lb. In aluminum, the part costs the same, but weight is trimmed to 112 lb. The molded fiberglass plastic panel weighs 21 lb and costs less than $50.

Side panels for the bed of one of Gisholt's machines cost around $1500 when made of iron or aluminum. Plastic cuts the cost two-thirds, to about $500. This ratio of savings varies depending on size and complexity of part.

Other cost points favor plastics. Gisholt says: "Our machine tool stylists and designers like plastics. They can get the best possible appearance at least cost. Shaping for contours and streamlined appearance costs less."

Says designer J. M. Little (J. M. Little & Associates, Toledo, O.), consultant to Gisholt: "The low cost of glass-reinforced plastic molds not only permits but encourages manufacturers like Gisholt to constantly change and improve products. Limited budgets and lengthy amortization cycles for molds are no longer retarding influences."

Benefits Both—Both users and builders gain. That's the story of plastics in machine tools. That's why Gisholt is getting more and more into the reinforced plastic business. A 2000-ton hydraulic press is being installed in its plastic shop. It will use heated metal molds. The matched mold will press shape the part. Heat will cure the resin.

It now takes three to six hours

red plastic part is removed from the mold. Curing is ne at room temperature and at low pressure

Flash is trimmed from cured piece. A plastic jig holds part. Holes for fasteners are drilled here, too

to turn out a plastic part depending on size and complexity. With the new press, a part running in larger volume will be made in three to seven minutes.

Gisholt expects its plastics department to capture enough outside business to keep the big press going full time. The company is offering complete service—the modelmaking and engineering needed from the inception of an idea to delivery of the finished part.

Key to Cost—Press production will be limited to fairly large runs because of metal die costs. Where only 100 to 200 pieces are needed, Gisholt will continue to use the low pressure molding process with plastic dies.

In fact, the cheaper plastic dies made molded plastic parts practical for machine tools. Production molds in Gisholt's shop are made with tooling compounds developed by Rezolin Inc., Los Angeles.

Process—The matched plastic mold is made by pouring the plastic tooling compound around a wooden pattern. After curing, the hard surface is polished as highly as desired.

Next comes the making of plastic parts (see photos, bottom of pages 101 and 102). A gel coat is applied to give the surface of the piece a homogeneous appearance and to keep glass fibers from showing through.

When the gel coating cures, but still has a sticky surface, several layers of fiberglass matting are cut to shape and placed in the mold by hand, layer by layer. Sometimes a prototype mold is used to lay up the fiberglass to make the initial piece.

Resin Added—Polyester resin (Bakelite Co. is one supplier) is then poured into the mold. The plug is put into the cavity and forced down to the stops with clamps. The mold is left like this at room temperature until the part is cured. For large parts with deep contours, a vacuum is applied to the mold cavity to hold the plug down.

When the part comes out of the mold, it goes into a plastic jig. Flash is cut off by an abrasive wheel and fastening holes are drilled.

The types of molds most generally used are matched steel molds, matched phenolic molds and shell molds. The economics of production determines the type of mold used. The average order for machine tool parts processed at one time by Gisholt using the matched phenolic molds, is about 30 pieces.

Cheaper Mold — Where fewer pieces are needed and inside s face finish requirements are not critical, a cheaper shell mold used.

Fiberglass is wrapped arou the wooden pattern. The polyes resin is applied. After curing, t part becomes the mold for m ing short-run parts.

This handwheel and two dials made of fiberglass plastic, using premix molding compound. Pla figures in contrasting colors molded in accurately

Making Plastic Parts

A cart full of untrimmed plastic pieces is shown by G. W. Watsey, manager, Gisholt's plastics department. Machine tool stylists say they get the best possible appearance at least cost with plastics

This 200-ton press being installed at Gish will be used for long runs. It will use heat matched, metal molds. Platen is 5 ft x 7

Delivering semi-finished steel to outside storage by Ross Carrier—Kaiser Steel Corp., Fontana Works, Fontana, California.

Here's production flow ingenuity...

Kaiser Steel's 1 2 3 Operation!

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2 Immediately a Ross Carrier rushes into action . . . locates the material.

3 Loaded in seconds, the Ross Carrier is on its way to delivery.

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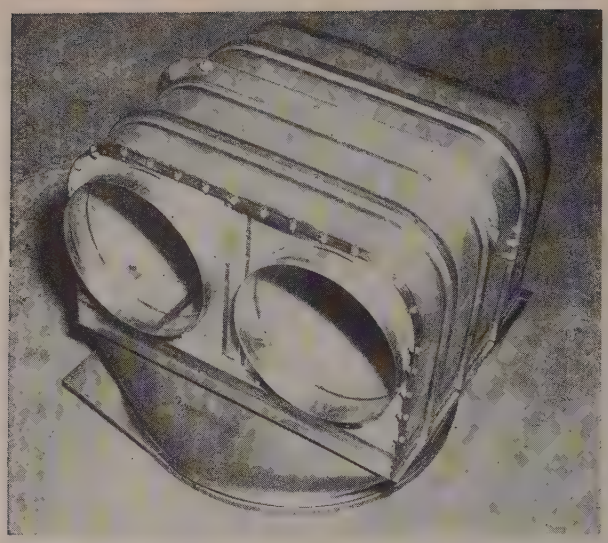
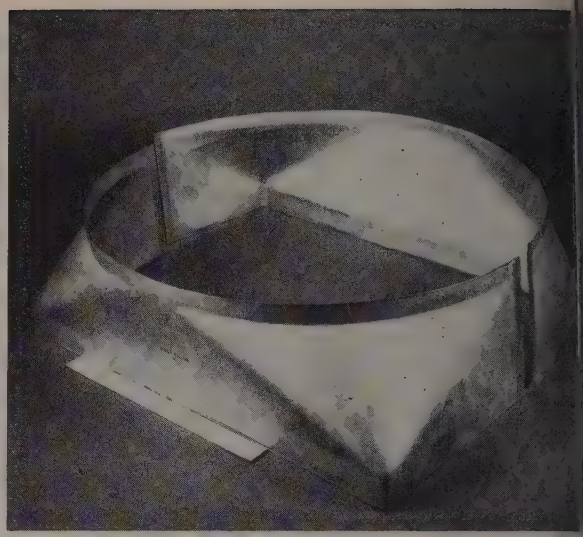


Plenum chamber assembly for Sikorsky XHR2S is fabricated almost entirely of titanium. The new light metal cuts the weight of the assembly nearly in half



Unusual transition from round to square is achieved in ti nium assembly located between plenum chamber and cooler. Only 5 in. high, it was hot-formed in stages

Titanium Takes Away the Heat

TO HELP Sikorsky lick cooling problems in its XHR2S assault transport helicopter, Ryan Aeronautical Co., San Diego, Calif., is building exhaust equipment of titanium.

An unfavorable power-weight ratio is inherent in helicopter design. The use of titanium instead of stainless steel in certain applications can bring weight savings up to 50 per cent.

Exhaust System—Main parts of the Ryan-built exhaust system include ejector-type exhaust stacks leading from the engine, a plenum chamber, mixing tubes and di fusers.

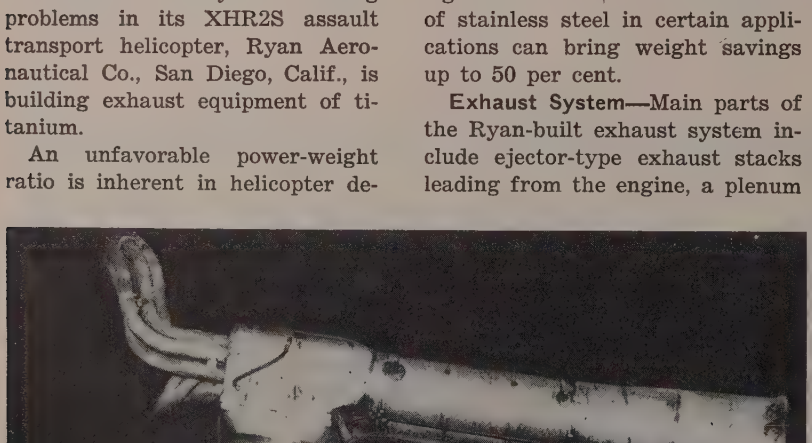
The three major problems i volved in producing the titaniu plenum chamber and its comp nents are fusion welding, sp welding and forming.

Fusion Welding—Ryan finds tha inert-gas, shielded welding is th only type of fusion welding tha can be done with titanium if ade quate physical properties are t be maintained. Extremely affin tive, molten titanium will reac with, and be embrittled by, a known welding fluxes, as well a air.

Proper cleaning is paramount i spot welding. Relatively hig electrode pressures and a shor weld time are other prerequisites

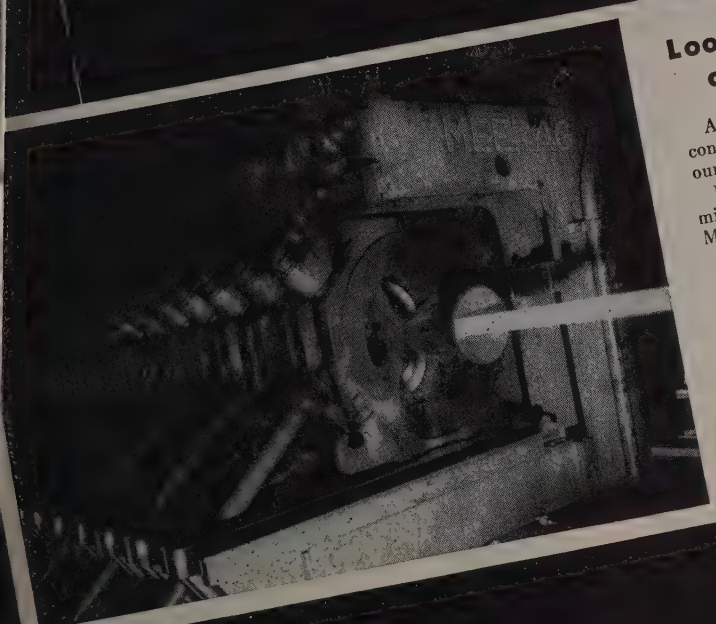
Forming—In forming titanium all bending radiuses are mad more generous. In some cases Ryan has used preheated sheets.

Stack tubes are 19-9 DL corro sion-resistant steel.



Complete augmenter system. Ejector stacks (upper left) lead to plenum chamber (left center). High velocity of exhaust gases creates pressure drop in chamber which sucks cooling air up air duct (lower left) and through engine oil cooler

Newest idea in seamless tube production



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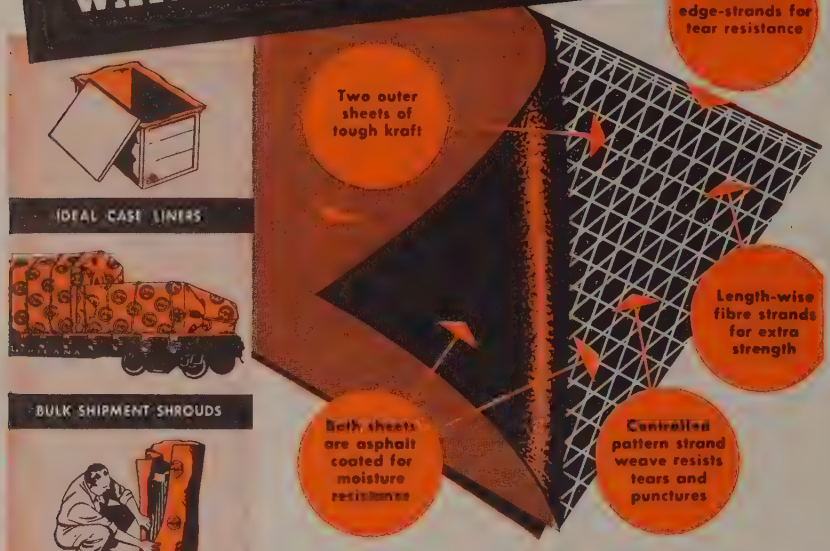
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The plastic pump removes the ch laden cutting fluid from this tur lathe chip pan. Plastic resists t abrasive action of the chips and t corrosion of the cutting oil

Corrosives Pump

It you're having trouble pumpir rough, tough materials, this pla tic pump will do it

A PUMP with a plastic bo handles the toughest corrosi chemicals and abrasive slurries industry. It is versatile enough handle materials as dissimilar mayonnaise and hydrochloric aci

The chief feature of the pump a flexible plastic liner. The on parts that come into contact wi the fluid being pumped are t outer surface of the flexible lin and the inner surface of the plast pump body block.

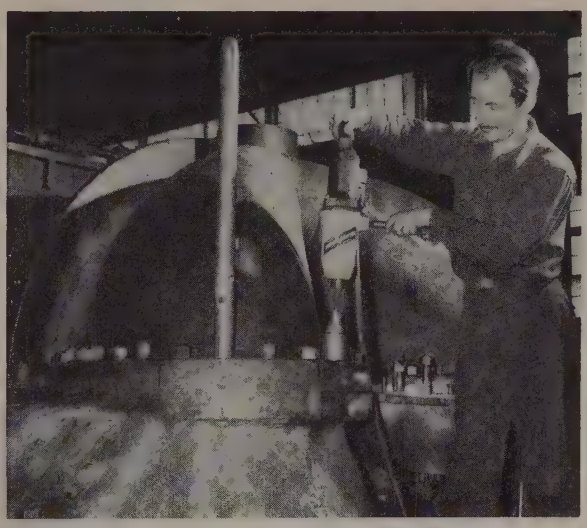
Developed by the Vanton Pum & Equipment Corp., Hillside, N. J the Flexiliner is run by a moto driven rotor which is mounted o an eccentric shaft. This creates squeegee pressure action betwe the liner and the body block.

The pump has no stuffing boxe shaft seals, check valves, gland or gaskets. Flexiliner also can b molded from materials with a va riety of corrosion resistance fea tures. They make it easy to adap the pump for a wide variety o uses.

One material being used fo liners is B. F. Goodrich's Hyca It resists oil, grease, gas, chem icals, heat, cold and abrasive ma terials.

Air Tool Combines Impact Nut-Running with Torque Control

Gas meters require 30 ft-lb of torque on front cover



Large tool runs nuts on ⅞-in. alloy steel studs

Here is an application of the torsion bar principle to torque control. Nuts can be run with great speed on an impact tool to a controlled torque.

After running a nut to the desired torque, the tool shuts itself off.

While a nut is being run, the tool operates at normal power and speed. When the required torque is reached and the nut-running resistance is equal to the stress preset in the torsion bar, the impact mechanism rebounds instantly and trips a rubber-faced, shut-off valve.

The tool can be set to the required torque in seconds. A jig turns a torsion bar and calibration collar to the desired reading against the rigid splines on the torque bar adjusting sleeve.

The torque setting remains constant for any nut-running operation until the adjustment is changed. Releasing the trigger resets the tool automatically to the same torque for the next nut.

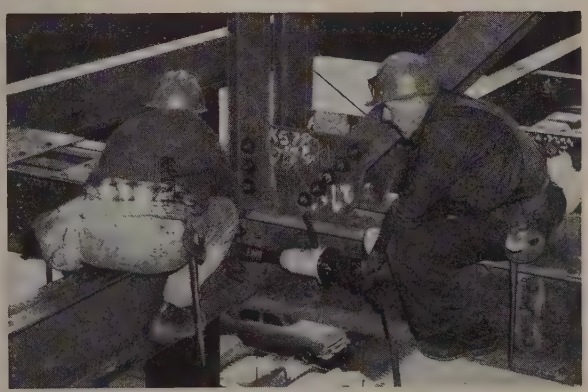
There is no need for pressure regulators, since the tool operates at full power and speed. An automatic shut-off eliminates "overtorque." Nuts are run fast; operators are not afraid to open the throttle wide.

The operation is reversible, with full power in either direction.

Maintenance is low; there is no clutch to wear, slip or need adjustments.

Inexperienced operators can use the tool accurately without any special training because the torsion bar torque control doesn't depend on the worker's sense of timing. All he need do is set the tool and pull the trigger.

Accuracy of the tool is shown by a customer's test.



Running up a crossmember takes 470 ft-lb of torquue

All of 280 readings taken on oil pan plugs were tightened within the required 35-to-45-ft-lb range. Nearly 80 per cent of the plugs were run in a 5 ft-lb range.

The tool comes in two sizes. Size 5040T is for general industrial use. It is small and easily handled. It has two torsion bars, one with a maximum torque of 60 ft-lb, the other with a top torque of 90 ft-lb.

Size 5340T tool is preset at 320 ft-lb when shipped from the factory but can easily be adjusted up to a maximum of 550 ft-lb.

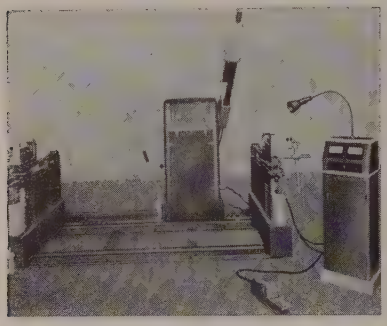
The larger size is for steel construction nut-running in the building of industrial plants, office buildings and bridges, as well as for heavy bolt-up work in general industry. *Write*: Air Tool Division, Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. *Phone*: Digby 4-6070

NEW PRODUCTS and equipment

Electronic Balancer

Rotors from 1 to 5000 lb can be balanced dynamically and kinetically by this balancer.

Diameters can range from 1 to 68 in. The kinetic sensitivity is 0.04-in.-oz; dynamic sensitivity is 0.25-in.^{2}-oz.



Starting, braking and speed are controlled remotely. The rotor is held down by a counterbalanced drive belt arm.

Only about 2 minutes are needed for setting up the machine. *Write*: Merrill Engineering Laboratories, 1240 Lincoln St., Denver 3, Colo. *Phone*: Cherry 4-5581

Paint Stick

Markings on metals made with this paint stick are permanent, weatherproof and fadeproof.

They will withstand steam, cleaning solutions or grease-cutting solvents, acids and alkalies, temperatures up to 500° F, pickling bath solutions and abrasive conditions of coke, sand and coal dust.

Colors are red, white, blue, green, yellow and black. *Write*: Markal Co., 3052 W. Carroll Ave., Chicago 12, Ill.

Welder

This portable machine does manganese steel and hard-facing work on irregular parts.

The welder plugs into conventional alternating or direct-current welding units with a single cable. It operates on a current from 150 to 450 amp.

A self-feeding mechanism keeps the welding arc constantly supplied with welding wire. A conical hopper mounted above the welding

wire outlet stores and feeds flux. The magnetic field created by the welding current causes the flux to stick to the wire.

The flux determines the composition of the weld. Fluxes available include manganese steel, martensitic iron and martensitic steel. *Write*: Amsco Division, American Brake Shoe Co., 230 Park Ave., New York 17, N. Y. *Phone*: Murray Hill 6-8970

Drum Lifter

Handling and storing drums are fast and easy jobs with this automatic grab. From three to six drums are moved with each lift.

To pick up a load, the grab is spotted over the drums and lowered until hooks engage the drum ends.

Drums are released by lowering the grab until the center bar forces the hooks open.

One hoist operator can do the whole job. *Write*: Downs Crane & Hoist Co., 540 W. Vernon Ave., Los Angeles 37, Calif. *Phone*: Adams 1-9215

Floor Lock

Materials handling trucks with wheels or casters from 3 to 8-in. high are locked without adjustment. The new lock replaces five lock sizes.

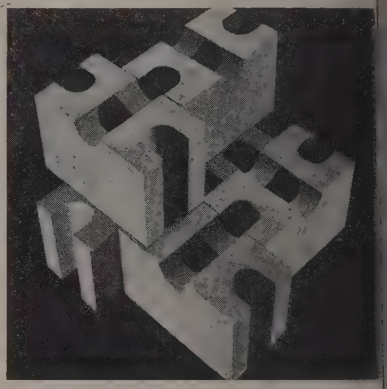
The lock has an increased gripping surface. It's safer; the operator doesn't have to put his foo in danger under the truck to se or release it.

The lock has ample clearance an is easy to install. *Write*: Lee En gineering Co., 269 Armistice Blvd Pawtucket, R. I. *Phone*: Pawtucke 5-6100

Checker

A solid 1¼-in. wall between eac flue is produced by a checker fo lining blast furnace hot stoves.

It gives from 25 to 50 per cen more heating surface than othe basket weave checkers. There ar two styles, one with a crossflue one without.



Because a lower stack tempera ture results from the increased heating surface, it is possible to use a steel bottom to support the checker system. *Write*: William M. Bailey Co., 1221 Banksville Rd., Pittsburgh 16, Pa. *Phone*: Lehigh 1-6131

Press Brakes

A 1000-ton hydraulic press has open end housings to permit work (up to the over-all length of the pressing surface) to pass through the press.

There are four ram speeds. Heavy steel plate up to ⅞-in. thick and 19 ft long can be handled. The

A NEAT WAY TO PLAY SAFE: JAL-TREAD FLOOR PLATE

Jal-Tread floor plate combines the strength and durability of high quality steel with a neat, distinctive checkerboard pattern scientifically designed for *safety*.

Whatever your application . . . in new construction . . . new equipment . . . or replacement jobs, Jal-Tread will assure you of these advantages:

Safe Footing—300 miniature squares per square foot—all of uniform height—provide maximum linear friction surface that protects you against lost-time accidents.

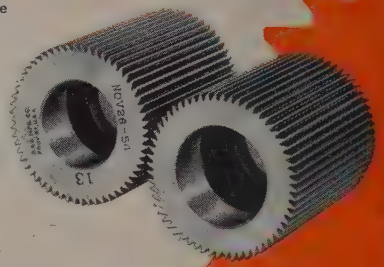
Easy Fabrication—The Jal-Tread straight line pattern simplifies welding, flanging, shearing, bending, punching, and drilling operations. Experience shows that Jal-Tread can be cold-formed on standard plate bending machines.

Easy Cleaning—The Jal-Tread straight line gutter pattern permits quick, thorough sweeping and draining in any direction.

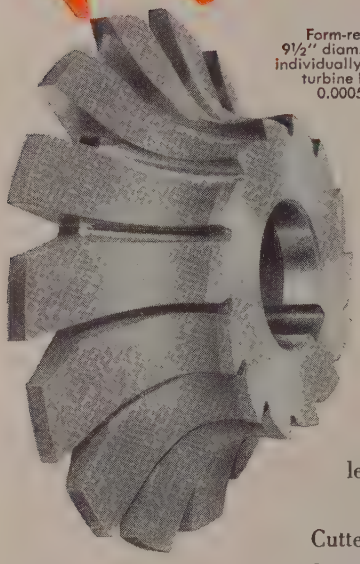
For safe, long-lasting flooring always specify J&L Jal-Tread . . . *it's available at leading distributors everywhere.*

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Money-Saving Slant on Special Cutters . . . from Brown & Sharpe



Matched pair of opposed profile-sharpened cutters engineered by Brown & Sharpe to finish-mill steel wire into high precision hosiery needle blanks at a single synchronized pass.



Form-relieved cutter, 9½" diam. — one of many individually designed to mill turbine blades within 0.0005" accuracy.

You can *always* save money by letting us handle unusual cutter jobs from design to finished cutters. Reasons? Cutter designers who are *specialists* . . . complete facilities for manufacture and heat treating . . . unmatched experience that covers the widest variety of milling problems. Results? . . . Typical cases are illustrated on this page. Cutters with plenty of "guts" . . . producing parts at lowest cost per piece . . . with highest sustained accuracy. What's *your* special cutter problem? Brown & Sharpe Mfg. Co., Providence 1, R.I., U.S.A.

Buy Through Your Local Distributor

Brown & Sharpe

B·S

ress will form, blank, bend, traighten and draw.

There is a sensitive ram-leveling evice and a ram tilt feature.

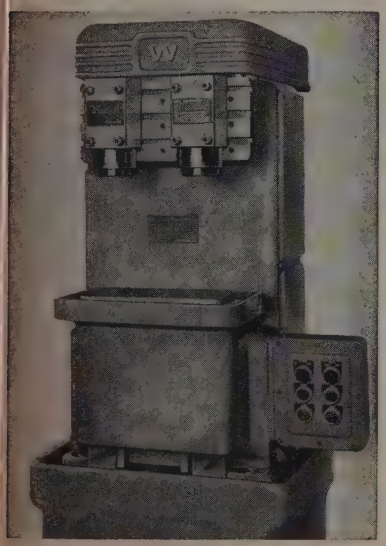
The press is 20 ft between hous-ngs. Its stroke is 16 in.

Other presses have capacities rom 500 to 2000 tons and lengths rom 6 to 30 ft. *Write*: Philips & Davies Inc., Kenton, O.

Verticle Boring Machine

Here is a tool for precision bor-ng, counterboring, facing and hamfering. Tolerances of 0.0001-n. can be held.

The machine is compact and rig-id; it requires only 4 sq ft of floor space.



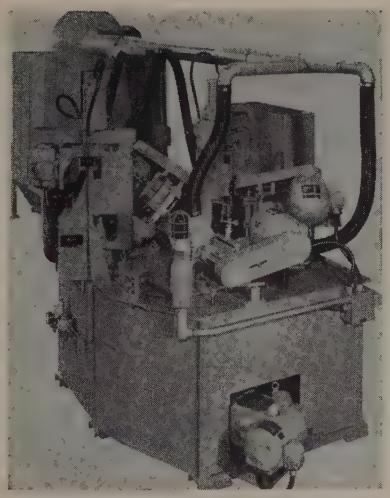
Standard cycle time can be var-ied from 5 to 80 seconds. The maximum stroke is 4 in.; top spin-dle speed is 8000 rpm. *Write*: Wa-dell Equipment Co., Garwood, N. J.

Deburring

An automated machine deburrs 200 multislitted, broached parts in an hour.

The part is placed on an expand-ing collet which holds it in place while it moves through five brush-ing stations and is indexed into four positions. All sides of the part are held against the brushes for the proper time.

Five crimped steel wire brushes 8 in. in diameter are used. They revolve at about 3000 rpm. Pene-



tration of the work is about 0.060-in. Each brush is driven by a 1-hp motor.

A vacuum system carries off chips. Each machine is designed for a special part. *Write*: Machine Division, Fuller Brush Co., Hart-ford 2, Conn. *Phone*: Jackson 2-2141

Localized Plating

A method for selective electro-plating, the Dalic process, repairs worn parts, plates selected areas of electrical contacts and elec-tronic parts. It plates plastic-met-al combinations, solders and car-burizes and gives automatic strip and wire plating.

Air and water-cooled styluses and special nontoxic, nonfuming so-lutions are used. *Write*: Marlane Development Co. Inc., 153 E. 26th St., New York 10, N. Y. *Phone*: Murray Hill 5-9427

Tube Printer

Bars, tubes, extrusions and rolled shapes can be printed by a light, hand printer without being moved.

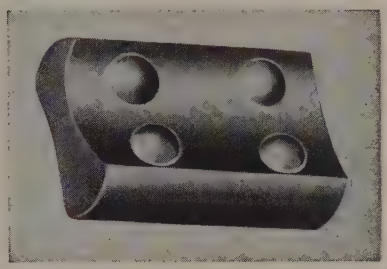
Flat, round and many-sided parts (from 5/16-in. up) can be handled without adjusting the printer.

Inspection marks, dates, codes

or tradenames are printed clearly. The unit meets "MIL-STD-183" for continuous identification marking of iron and steel products. *Write*: Pannier Corp., 207-209 Sandusky St., Pittsburgh 12, Pa. *Phone*: Fair-fax 1-5185

Weld Pad

Tubular sections can be joined with the concave weld pad in a fraction of a second by resistance welding. Lines are neat and clean, and there is no disfiguration of the tubes.



Pads are furnished in various radii to fit pipe diameters. *Write*: Ohio Nut & Bolt Co., 33 First Ave., Berea, O. *Phone*: Berea 4-5464

Coil Bender

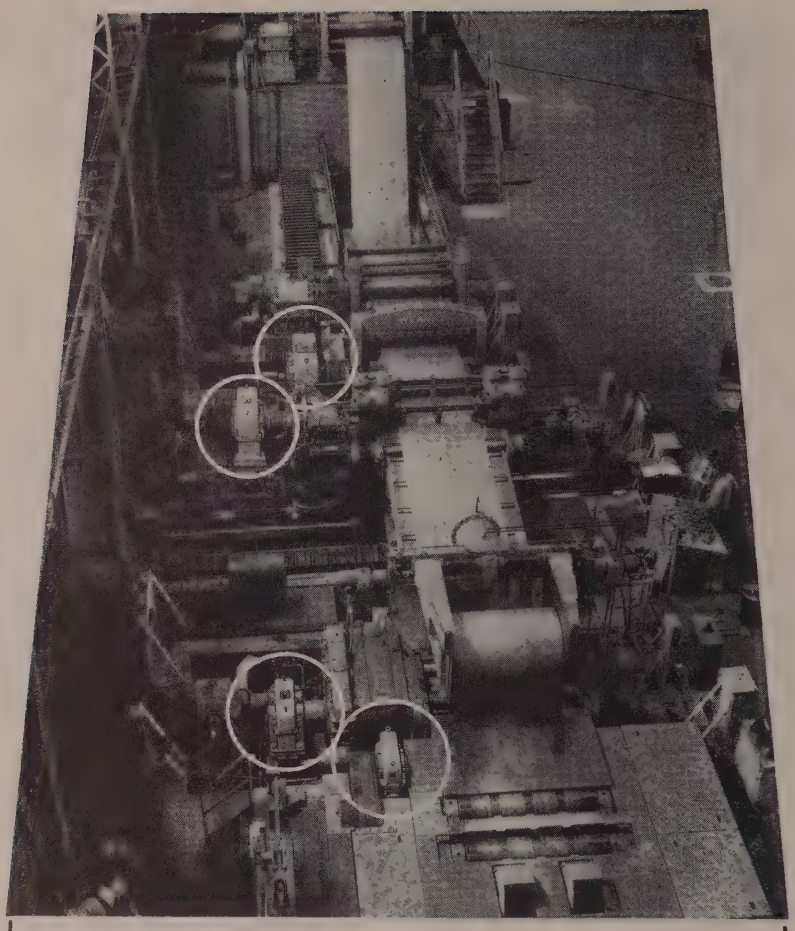
This bending machine makes continuous serpentine coils from a single length of tubing. Accurate and uniform coils can be made in minutes without removing the tub-ing from the machine.

Annealed ferrous and nonferrous tubing (from ¼ to 1 in. OD) can be bent. No welding is needed. The machine adapts to standard bending. *Write*: Leonard Precision Products Co., 9200 Bolsa Ave., Santa Ana, Calif. *Phone*: West-minster 5261

All-Position Electrode

Excellent arc stability on both alternating and direct current is claimed for the Fleetweld 37 elec-trode. The arc is soft and easy to handle.

Slag characteristics make for



Proven Trouble Free Service and Economy of Operation

The Wean Engineering Company have built and installed continuous pickle lines (similar to the one illustrated above) in most of the leading steel companies . . . and for many years have *specified* H & S Reducers and Pinch Roll Drives. By experience Wean has proved that H & S products give trouble free service and economy of operation due to their exceptionally Rugged Construction and Ample Overload Capacity.

It will pay you to learn more about the high quality and superb construction of H & S products.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on Company Letterhead for 488-Page Catalog 49

NEW PRODUCTS and equipment

quick removal, good bead appea ance and simplify vertical up welc ing. The soft arc handles poo fit-up well and makes edge and co ner welds clean and smooth. Th tendency to burn through whe welding thin gage metals is min mized.

The electrode comes in 1/8, 5/3 and 3/16-in. sizes. *Write*: Lincol Electric Co., 22801 St. Clair Ave Cleveland 17, O. *Phone*: Ivanho 1-8100

Surface Grinder

A precision grinder has a built in, direct, 2-hp motorized spindle

Feeds are automatic. The ma chine does precision grinding a

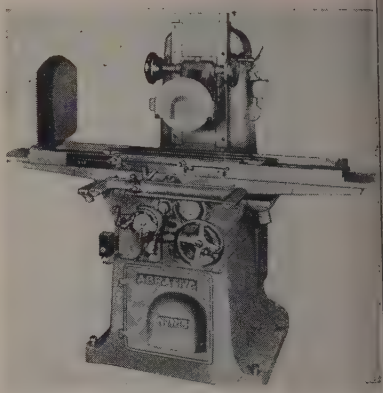
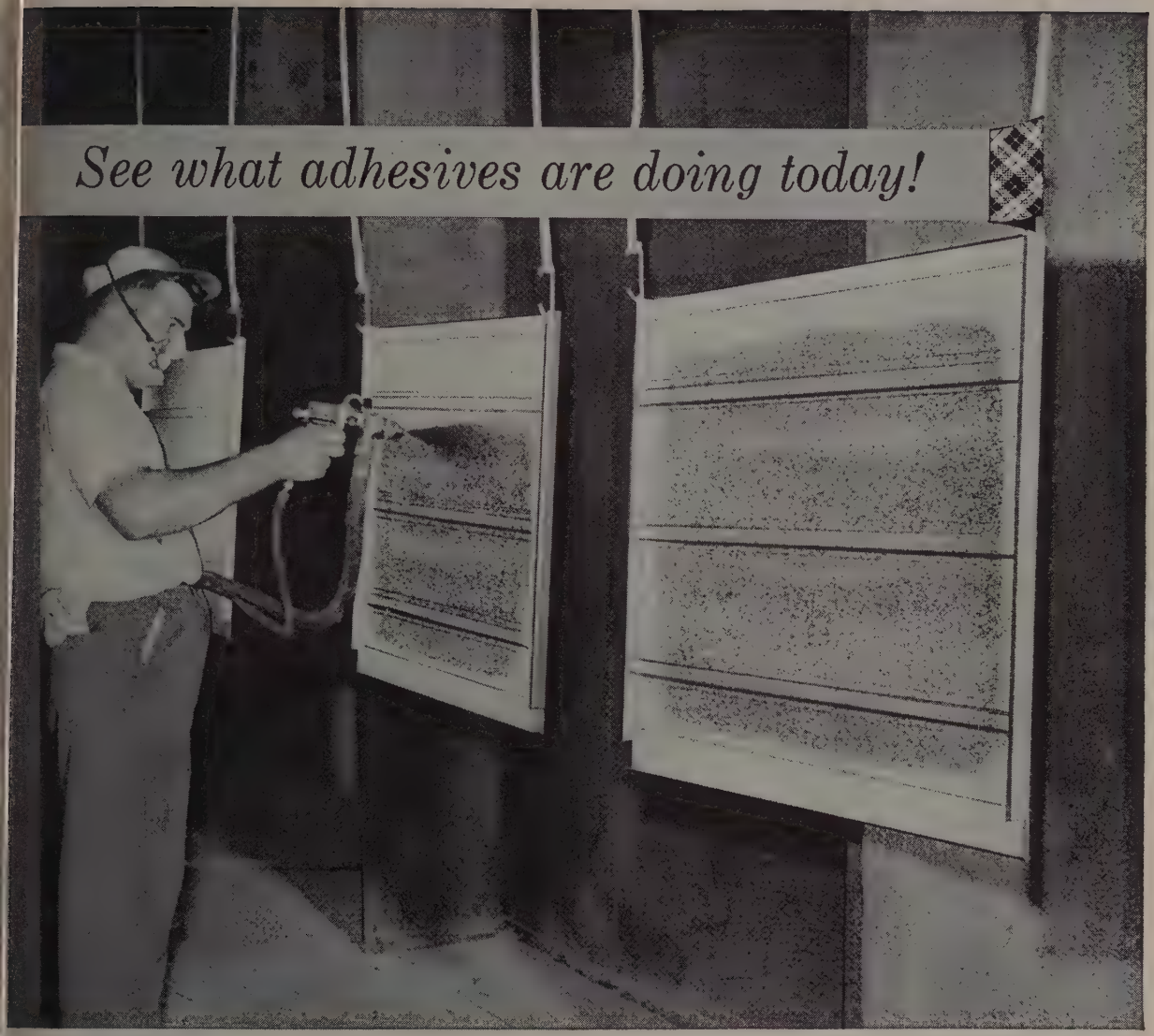


table speeds of from 20 to 60 ft a minute. The work capacity is 8 x 12 x 24 in. *Write*: Abrasive Ma chine Tool Co., East Providence, R. I. *Phone*: 1-0549

Enclosed Motors

Nonventilated, fan-cooled motors built to the new NEMA standards use less space and give larger horsepower output.

The motors are for operation



Taking the noise out of sound

With movable wall panels, like those pictured above, you can build a room anywhere—in the factory, in the office, in the laboratory. But the new room would be impractical unless it were protected from outside vibration and noise. That's where 3M comes in.

EC-1000 is a vibration and sound damping coating that withstands high temperatures directly after application. Immediately after EC-1000 is sprayed on the back side of the metal panels, they are primed and run through the baking ovens! There's no lost motion . . . no production line slowdown. And once installed, walls treated with EC-1000 make a room that is quieter, easier to work in, relatively unaffected by external noise and vibration.

See what adhesives can do for you...

Perhaps you have a production problem 3M can help you solve. A 3M field engineer will be glad to consult with you on your specific requirements. Or, for a free booklet on cost-cutting 3M adhesives, write 3M, Dept. 301, 417 Piquette, Detroit 2, Mich.

3M COMPANY

ADHESIVES AND COATINGS DIVISION **MINNESOTA MINING AND MANUFACTURING COMPANY**

417 PIQUETTE AVE., DETROIT 2, MICH. • GENERAL SALES OFFICES: ST. PAUL 6, MINN. • EXPORT: 122 E. 42 ST., N. Y. 17, N. Y. • CANADA: LONDON, ONT.

MAKERS OF "SCOTCH" REG. U. S. PAT. OFF. BRAND PRESSURE-SENSITIVE ADHESIVE TAPES • "SCOTCH" REG. U. S. PAT. OFF. BRAND SOUND-RECORDING TAPE • "SCOTCHLITE" REG. U. S. PAT. OFF. BRAND REFLECTIVE SHEETINGS • "3M" ABRASIVE PAPER AND CLOTH • "3M" ADHESIVES AND COATINGS • "3M" ROOFING GRANULES • "3M" CHEMICALS

where noncombustible dust and moisture are prevalent.

They come in 182, 184, 213, 215 254U and 256U frames. Larger ratings will be available soon in rerated frame sizes.

Previous NEMA frames (203 through 505) are still being made. *Write*: Electro Dynamic Motor & Generator Division, General Dynamics Corp., Bayonne, N. J. *Phone*: Federal 9-0420

Cutting Torch

This cutting and gouging torch operates from a direct-current welding machine and a compressed air line.

The torch has impact-resistant jaw insulators and a silicone glass laminate sleeve to protect the upper end of the handle from heat.

A rotating nozzle changes the electrode angle to suit the job, but keeps the air jet in perfect alignment. Depth of cut and amount of metal removed can be controlled closely by the operator. *Write*: Arcair Co., 423 S. Mt. Pleasant St., Lancaster, O. *Phone*: 6068

Hot Surface Paint

An elastic black paint made of a black pitch base bolstered with a silicone additive gives maximum protection for surfaces up to 750° F.

The paint forms a heavy-bodied coating that does not blister or become brittle when subjected to varied temperatures, smoke, fumes, mild industrial acids, alkalies and moisture.

The paint air dries to a smooth finish in 8 to 10 hours.

Recommended uses: Protection of heat lines, radiators, condensors, compressors, turbines, boilers, stacks, tanks, ovens, furnaces, vats, separators and exhaust manifolds. *Write*: Speco Inc., 7308 Associate Ave., Cleveland 9, O. *Phone*: Atlantic 1-9520

NEW literature

Write directly to the company for a copy

Tubular Rivets

A 4-page booklet tells how to apply various types of rivets and gives dimensions and specifications. Townsend Co., New Brighton, Pa.

Solder

Alloys for soldering cast iron, aluminum and stainless steel are described. Anchor Metal Co. Inc., 244 Boerum St., Brooklyn 6, N. Y.

Fork Trucks

Electric trucks of 4000 and 6000-lb capacity are covered in 6-page bulletins, 1324-C and 1325-D. Baker-Raulang Co., Cleveland 2, O.

Arc Welder

A machine with current (both alternating and direct) and voltage control is described in 8-page bulletin 1343. Lincoln Electric Co., Cleveland 17, O.

Adhesives

Curing temperatures and suggestions on the use of 30 adhesives for bonding metals and plastics to themselves and to each other are given in a data chart. Dept. P, Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J.

Ventilated Clutch

Dimensions and capacities of a clutch built for heavy-duty service are given—bulletin ML-102-A, 8 pages. Fawick Airflex Division, Fawick Corp., 9919 Clinton Rd., Cleveland 11, O.

Transformer Laminations

Data and drawings on 100 standard lamination shapes are given in a 120-page book. Sales Dept., Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

Air Cylinders

Air valves, clamps, cylinders and dial feed indexing tables are presented in a 34-page catalog. A. K. Allen Co., 57 Meserole Ave., Brooklyn 22, N. Y.

Vibration Control

A material which effectively isolates vibration, shock and noise in massive machinery is described—bulletin IS-55, 4 pages. Industrial Division, T. R. Finn & Co. Inc., 200 Central Ave., Hawthorne, N. J.

Steam Cleaner

A cleaner with 300-psi pressure fo continuous, heavy-duty cleaning described—8 pages. Malsbary Mfg Co., 845 92nd Ave., Oakland 3, Cali

Architectural Aluminum

New booklets give information o wall systems, aluminum in architec ture, aluminum products in industria construction, roofing and siding an industrial building products. Roon 773 Alcoa Bldg., Aluminum Co. o America, Pittsburgh 19, Pa.

Thermocouple Insulators

Properties of refractory tubin and beads are presented in a 6-pag bulletin. Stupakoff Division, Carbo rundum Co., Latrobe, Pa.

Roll Formed Shapes

A 26-page catalog illustrate some of the sections being produce in ferrous and nonferrous metals Roll Formed Products Co., 3760 Oak wood Ave., Youngstown, O.

Enclosed Presses

Multiple point presses for automat ed production lines are described i catalog 11B, 32 pages. E. W. Blis Co., Canton, O.

Iron Powder Electrode

A low hydrogen electrode with a increased deposition rate is describe in bulletin 23, 2 pages. McKay Co. 1005 Liberty Ave., Pittsburgh 22. Pa

NEW BOOKS

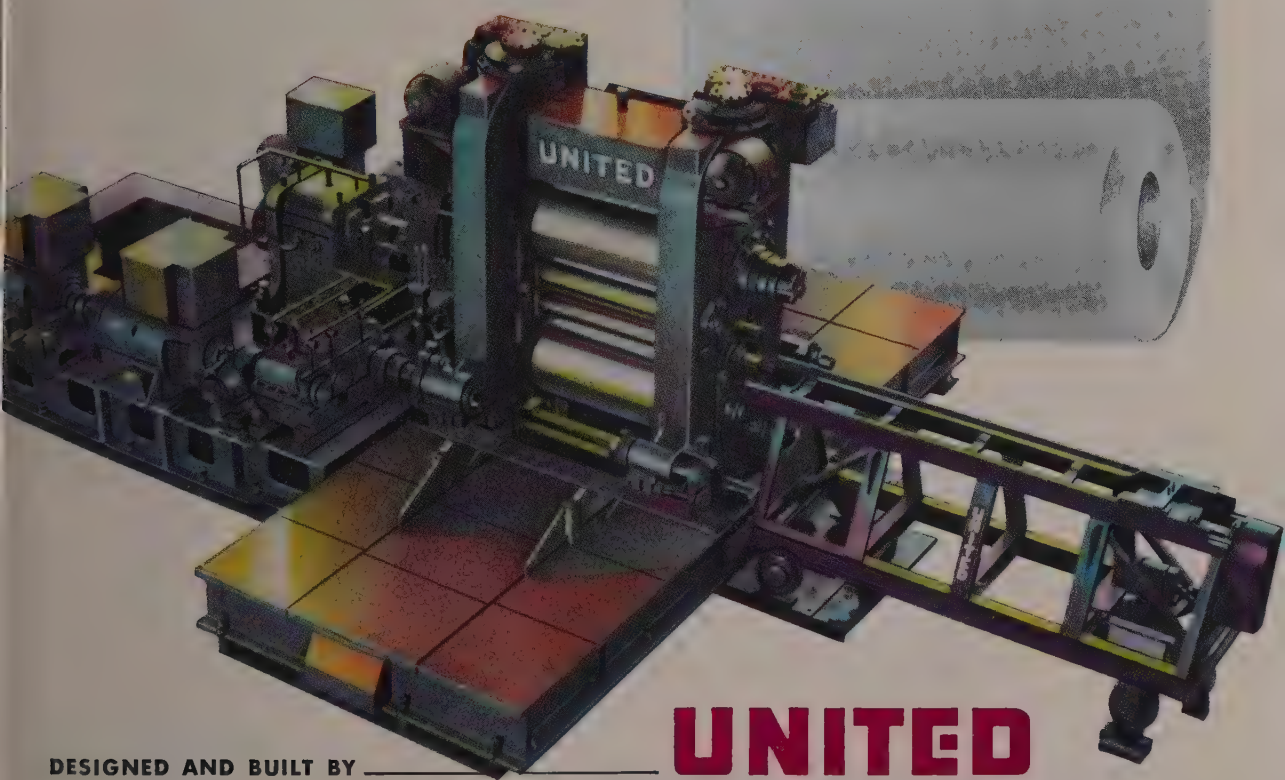
Specifications and Tests for Electrodeposited Metallic Coatings, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 104 pages, $1.85.

A compilation of 17 specifications tests and recommended practices is of interest to those concerned with electroplating, the purchase or sale of plated products or the use of protective coatings.

Elevated Temperature Properties of Carbon Steels, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa., 68 pages, $3.75.

Data for tensile and yield strength, elongation and reduction of area, stresses for creep rates of 0.0001 and 0.00001 per cent per hour and rupture strengths for 100, 1000, 10,000 and 100,000 hours are given in this carbon steel compilation. Properties are presented in graphs which are supplemented by copies of original data sheets.

UNITED®
ALUMINUM FOIL MILL



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ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

esigners and Builders of Ferrous and Non-Ferrous Rolling ills, Mill Rolls, Auxiliary Mill and Processing Equipment, resses and other heavy machinery. Manufacturers of Iron, odular Iron and Steel Castings and Weldments.

Plants at: Pittsburgh • Vandergrift • Youngstown • Canton
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Subsidiaries: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Ind.

FOLLANSBEE has been able to maintain its reputation for quality strip steel only by strict control through every phase of production. The steel for your order is yours from the moment Follansbee mill operators begin to fashion it to your specifications.

Your Follansbee representative, knowing that the plant will always deliver a quality order, concentrates on being of service to you. Why not get in touch with him before you place your next order for strip steel.

FOLLANSBEE

STEEL CORPORATION

FOLLANSBEE, WEST VIRGINIA

Cold Rolled Strip • Terne Roll Roofing • Polished Blue Sheets and Coils

Sales Offices in Principal Cities

STEEL

January 30, 1956

Market Outlook

STEELMAKERS are warning against attaching too much significance to the slowing down in automobiles, especially its impact in the steel market.

Despite the "flutter" in automotive requirements, over-all demand for steel is as strong as ever. Leveling off in auto needs has had relatively little effect in the market, apart from conversion business. And some consumers continue to take in semifinished steel on order, if for no other reason than to build up a cushion to tide them over if there is a steel strike.

FEW CANCELLATIONS—Reduced automobile assemblies indicate less consumption of steel in that industry in the weeks ahead. But cancellations or delivery deferments at mill level have not been in sufficient volume to materially brighten early supply prospects for other consuming lines.

Sheet producers are being pressed from all sides by customers seeking a share of whatever tonnage is released on automotive account. Generally, it appears that mill quotas for second quarter will be about the same as in the first three months of the year. Released auto tonnage will merely reduce the monthly carry-over.

SECOND QUARTER BOOKINGS—An increasing number of mills are accepting orders for second quarter shipments. Some of them are booking for the entire period, but others are continuing to take tonnage for only one month at a time. Consumers, generally, are placing all the tonnage the producers will accept.

The mills, in setting up second quarter schedules, are allowing for less carry-over than in about a year. Some steelmakers, in fact, are counting on being almost current with demand.

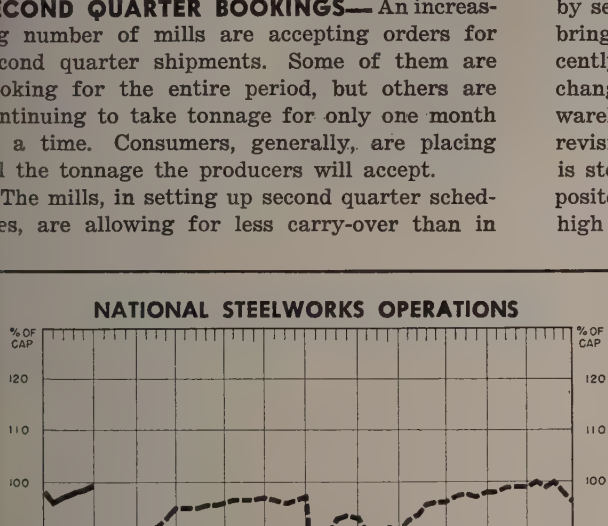
INVENTORY BUILDING—Low consumer inventories lend support to the conviction that strong demand will hold throughout the first half of the year. Chances appear good that buyers will order for stocks even though consumption should slip a little between now and summer.

Further, the warehouses, supply sources for hundreds of thousands of small consumers, must quickly replenish their depleted inventories. In shipping 8.8 million tons into consumption last year, the distributors dipped into their stocks to the tune of 700,000 net tons. Their supplies today are the lowest in a long time.

PRODUCTION—Steel mills pushed ingot production to an all-time high in the week ended Jan. 29, lifting the estimated operating rate 1 point to 99.5 per cent of capacity. This is equivalent to an output of about 2,449,000 net tons, and it compares with the previous week's record tonnage of 2,437,000.

PRICES FIRM—Markets for steel products continue steady pricewise. Except for action by several producers on bars and stainless steel, bringing their prices into line with those recently effected by other mills, prices are unchanged at the mill level. Various revisions in warehouse prices have been made to reflect mill revisions. STEEL's composite on finished steel is steady at $128. The steelmaking scrap composite at $51.50 is off $1.83 from the all-time high of $53.33 established the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Jan. 29	Change	Same Week 1955	Same Week 1954
Pittsburgh	101	— 1*	82.5	86
Chicago	99	0*	87.5	83.5
Mid-Atlantic	99	+ 2	78	81
Youngstown	100	0	88	70
Wheeling	98.5	+ 1	94.5	73
Cleveland	100.5	— 1.5*	91.5	83
Buffalo	105	0	100	71
Birmingham	96.5	0	74	87
New England	90	— 4	78	55
Cincinnati	96	+ 8	85	71.5
St. Louis	99	0	87.5	48
Detroit	100	— 4	91	83.5
Western	110	+ 4	88	79
National Rate	99.5	+ 1	84.5	73

INGOT PRODUCTION‡

	Week Ended Jan. 29	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	150.2†	151.7	143.7	127.7
NET TONS (In thousands)	2,413†	2,437	2,309	2,051

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954

Metalworking Outlook—p. 33 Technical Outlook—p. 83

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 24 1956	Jan. 17 1956	Month Ago	Jan. Average
(1947-1949=100)	155.8	155.8	155.6	155.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 24

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parenthesis. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.175
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	8.243
Tie Plates	5.625	Strip, C.R., Stainless, 403 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.406
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.997
Plates, Carbon	4.950	Pipe, Galv., Buttweld (100 ft)	21.137
Structural Shapes	4.867	Pipe, Line (100 ft)	167.167
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H. R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W-18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.425	Tubing, Mechanical Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.933
Bars, H.R., Carbon	5.500	Tin Plate, Electrolytic, 0.25 lb	7.633
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.733
Bars, C.F., Carbon	8.770	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.200	Wire, Drawn, Stainless 430 (lb)	0.584
Bars, C.F., Stainless, 302 (lb)	0.471	Bale ties (bundle)	6.473
Sheets, H.R., Carbon	5.145	Nails, Wire, 8d Common	8.595
Sheets, C.R., Carbon	6.214	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.770	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 25 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	209.10	209.10	208.90	194.53	171.92
Index in cents per lb	5.665	5.665	5.659	5.270	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$128.00	$128.00	$127.68	$117.82	$106.00
No. 2 Fdry, Pig Iron, GT	58.99	58.99	58.99	56.54	52.54
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	52.16
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	53.27
Steelmaking Scrap, GT	51.50	53.33	51.83	35.25	46.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 25 1956	Week Ago	Month Ago	Year Ago	5 Y Ag
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.7
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.7
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	4.1
Bars, C.F., Pittsburgh	6.25	6.25	5.90	5.40	4.5
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.25	3.6
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.6
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.9
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.7
Plates, Chicago	4.50	4.50	4.50	4.225	3.7
Plates, Coatesville, Pa.	4.80	4.80	4.80	4.225	4.1
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.7
Plates, Claymont, Del.	4.80	4.80	4.80	4.225	4.1
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.60-3.
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.6
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.3
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.3
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.5
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.8
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.75-4.
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.6
Strip, C.R., Pittsburgh	6.25	6.25	6.25	5.75	4.65-5.
Strip, C.R., Chicago	6.25-6.35	6.25-6.35	6.35	5.85	4.9
Strip, C.R., Detroit	6.35	6.35	6.35	5.90	4.35-5.
Wire, Basic, Pittsburgh	6.60	6.60	6.25	5.75	4.85-5
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.90-6
Tin plate (1.50 lb), box, Pitts.	$9.45	$9.45	$9.45	$9.05	$8.7
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$66.
Wire rods, 7/32-9/32" Pitts.	5.025-5.375	5.025-5.375	5.025	4.675	4.10-4.
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$53.0
Basic, Valley	58.50	58.50	58.50	56.00	52.0
Basic, deld. Phila.	62.16	62.16	62.16	59.66	56.3
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	52.5
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	52.5
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	52.5
No. 2 Fdry, deld. Phila.	62.66	62.66	62.66	55.16	56.8
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	48.8
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	55.5
Malleable, Valley	59.00	59.00	59.00	56.50	52.5
Malleable, Chicago	59.00	59.00	59.00	56.50	52.5
Ferromanganese, Duquesne	205.00†	205.00†	190.00†	190.00†	188.0

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$50.50	$54.50	$51.00	$35.75	$46.5
No. 1 Heavy Melt, E. Pa.	55.00	55.00	55.00	36.00	47.5
No. 1 Heavy Melt, Chicago	49.00	50.50	49.50	34.00	45.0
No. 1 Heavy Melt, Valley	54.50	57.50	52.50	36.50	46.2
No. 1 Heavy Melt, Cleve.	52.00	54.50	51.50	33.50	45.7
No. 1 Heavy Melt, Buffalo	47.50	47.50	45.50	30.50	51.5
Rails, Rerolling, Chicago	67.50	72.50	71.00	49.00	67.0
No. 1 Cast, Chicago	49.50	51.50	50.50	40.00	62.0
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.75	$14.7
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	17.5
Oven, Fdry, Chicago	27.00	27.00	25.75	24.50	21.0

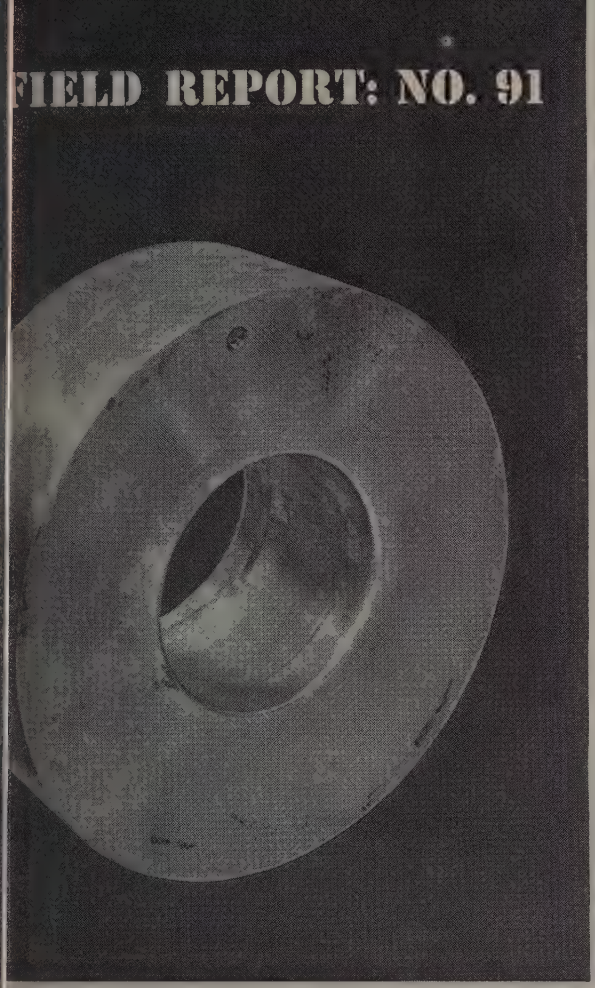
Daily Nonferrous Price Record

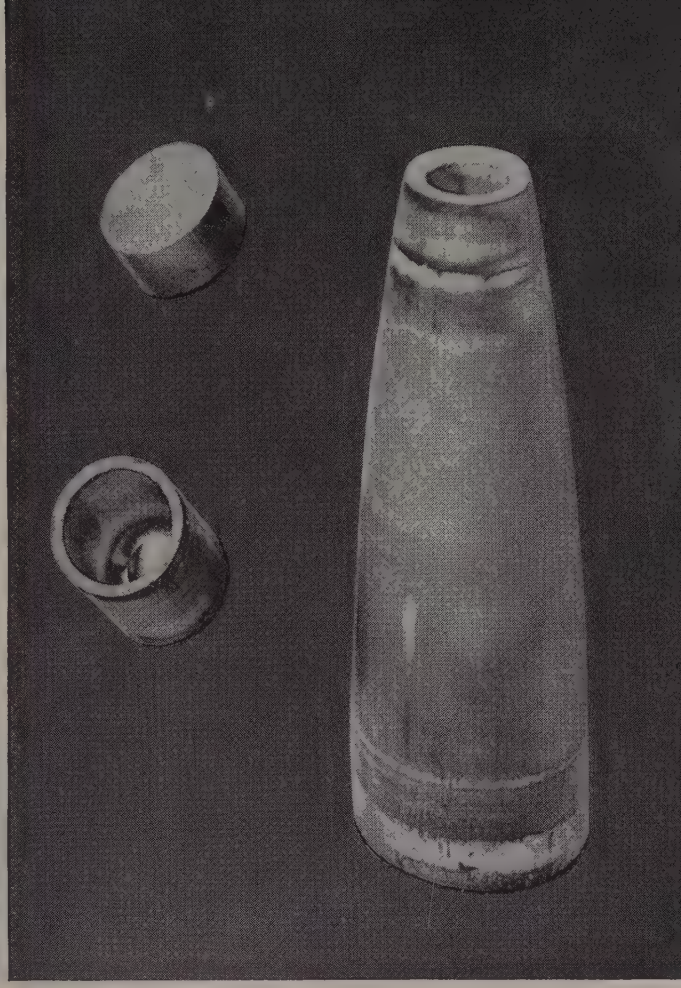
	Price Jan. 25	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1955 Avg.
Copper	43.00–50.25	Dec. 29, 1955	43.00–50.00	46.053	44.420	30.180
Lead	15.80	Jan. 13, 1956	16.30	15.358	15.300	14.800
Zinc	13.50	Jan. 6, 1956	13.00	13.000	13.000	11.500
Tin	103.125	Jan. 25, 1956	104.00	107.98	97.825	87.280
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum	24.40	Aug. 8, 1955	23.20–24.40	24.400	24.400	22.900
Magnesium	32.50	Aug. 16, 1955	28.50	32.500	32.500	27.000

Quotations in cents per pound based on COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**





WHICH DIE STEEL WOULD YOU USE HERE to increase production from 100 to 23,000 parts?

Even after trying many different die steels, production veraged only about 100 pieces before this ring die had o be replaced.

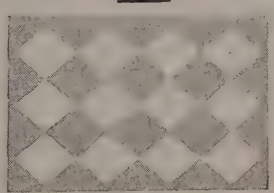
The die cold forms cups as the first operation in producing rocket projectile noses from SAE 1010 Steel. Even though the ring die is press fitted into a four foot liameter hardened retainer ring (Rc. 34/36), the 1700 ons of pressure exerted in power extrusion prematurely tretches the die. The 12 lb. 2 oz. cups must be held within .2 of a lb. and wall thickness within .010".

Which die steel would you specify in a move to cut eplacement costs and improve production?

From our customer Field Report files, here's how the oolroom solved the problem. The Carpenter Matched Set Method showed that Carpenter VEGA (Air-Tough) Die Steel was a natural for the job. Latest report shows hat the VEGA ring die had increased production from 100 to 23,000 cups, and is still banging them out.

What better guarantee of success can you find for your own jobs than the word of hundreds of toolroom men who rely on Carpenter. Why settle for "ordinary" results when Carpenter is ready to help you explore the possibility for improvement? Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor now. *The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.*

How can your toolroom use Carpenter Matched Tool and Die Steels to:



Reduce hardening hazards
Minimize machine downtime
Boost output per grind
Improve product quality

Carpenter STEEL

Matched Tool and Die Steels

IMMEDIATE DELIVERY from local warehouse stocks — Export Address: Port Washington, N. Y. — "CARSTEELCO"

Nonferrous Metals

U. S. lead producers watch the ups and downs of the London market while attempting to establish a firm domestic price. Nickel situation calls for study and understanding

Nonferrous Metal Prices, Pages 124 & 125

AS THE LEAD market began to settle last week a dock strike in Australia started prices up on the already jittery London Metal Exchange.

Domestic Scene—While anything can happen, there is a growing feeling that the domestic price (16 cents a pound) is a sound one and that it is becoming increasingly important to establish a firm market at this level.

Current influences: The lead market is in its seasonal doldrums which will continue until about February. To make the lull even quieter, sales are being lost as automakers begin to cut back production some 10 to 15 per cent. So it is reasonable to assume that prices will stay at 16 cents.

But the determining factor will be the London market. If the price on the LME continues to rise, or levels off at a price which will attract Mexican lead, domestic producers would have little choice but to hike prices.

Meanwhile—The Lead Industries Association estimates that the domestic supply (see table) was 1.3 million tons in 1955. Industrial consumption was 1.2 million, with some 80,000 to 90,000 tons going to government stockpile. Point to remember: A lion's share of the federal take came during the first half of last year. During the third and fourth quarter, civilian demand was so high that the U. S. made little more than token purchases. There could be a few tight weeks during the year, but the outlook for lead is for firm demand, with supply and demand coming out about equal. If civilian demands should dip, government purchases through the General Services Administration will be the equalizer.

Nickel: Problems Mount

As the distribution of nickel gets more involved, purchasing agents are beginning to relish the idea of a possible secondary source of supply.

While there is a crying need for nickel, it will take sound thinking on the part of the government to avert an oversupply of this metal which is selling on the gray market at $2.75 to $3 a pound. The government has a habit of suddenly stopping purchases when it decides that the federal stockpile is in sufficient supply. If the government stopped buying tomorrow, there would be an oversupply in a relatively short time. This is the problem faced by International Nickel Co. and National Lead Co. National Lead wants to be the nation's No. 2 source of supply. If the government is going to approve such a move, which will call for the custom smelting of Nicaro nickel in this country, then the administration should shoulder the responsibility for a realistic stockpiling policy. This should include a gradual decline in purchasing when the stockpile has reached its quota.

LEAD BALANCE IN 1955

(Net tons)

SUPPLY 1,300,000	
From domestic ores	330,000
From foreign ores & base bullion	166,000
Secondary lead	490,000
Imports	264,000
From smelters' stocks	50,000
DEMAND . . . 1,290,000	
Industrial consumption	1,200,000
Government stockpile	90,000

Source: Lead Industries Association estimates

Zinc Demand Dips

After registering a record year in '55, zinc demand is tapering off a bit. Most observers point out that demand always slackens after a price rise and that it will take another week or so to see how first quarter demand will be. Other factors: 1. Since the price rise and the announcement of some production cutbacks in the auto industry, foreign speculators, who had been holding quantities of zinc, have begun to dump supplies on the open market. Some of this is finding its way into consumer hands in the U. S. 2. Several producers are bringing in new capacity which should begin to make a difference in the supply picture by the third quarter. This is helping to create some reluctance on the part of the users to buy more than immediate needs.

Copper Skies Brightening?

Copper continues to be in short supply, but most production facilities are going at full tilt. The recent Chilean and Laurel Hill strikes have forced some users into the outside market. While willing to pay over 51 cents a pound for February metal they are finding that only small quantities are being made available to them. Peak prices and demand and high-level operations are instilling a growing confidence among leading producers. Most observers contend that copper will catch up with demand, labor willing, during the second half.

Market Memos

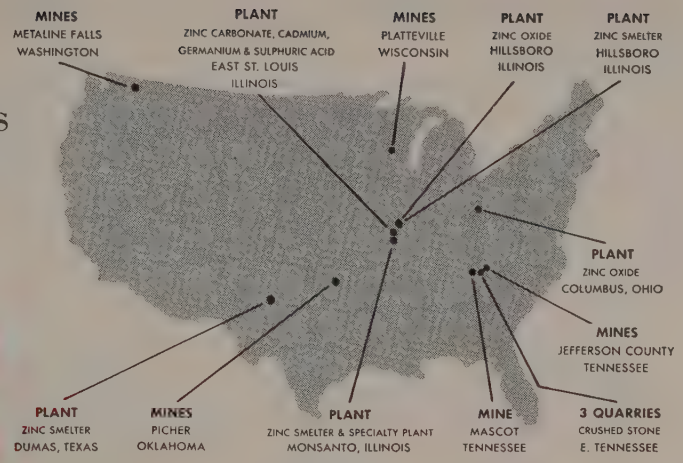
- Olin Mathieson Chemical Corp. will enter the aluminum industry with a new plant on the Ohio river (Clarington, O.). The facilities will consist of alumina and reduction plants and a rolling mill. Capacity of the aluminum plant will be 60,000 tons. The alumina plant will have an annual capacity of 230,000 tons. A $30-million power plant will be built at Cresap Bottom, W. Va.

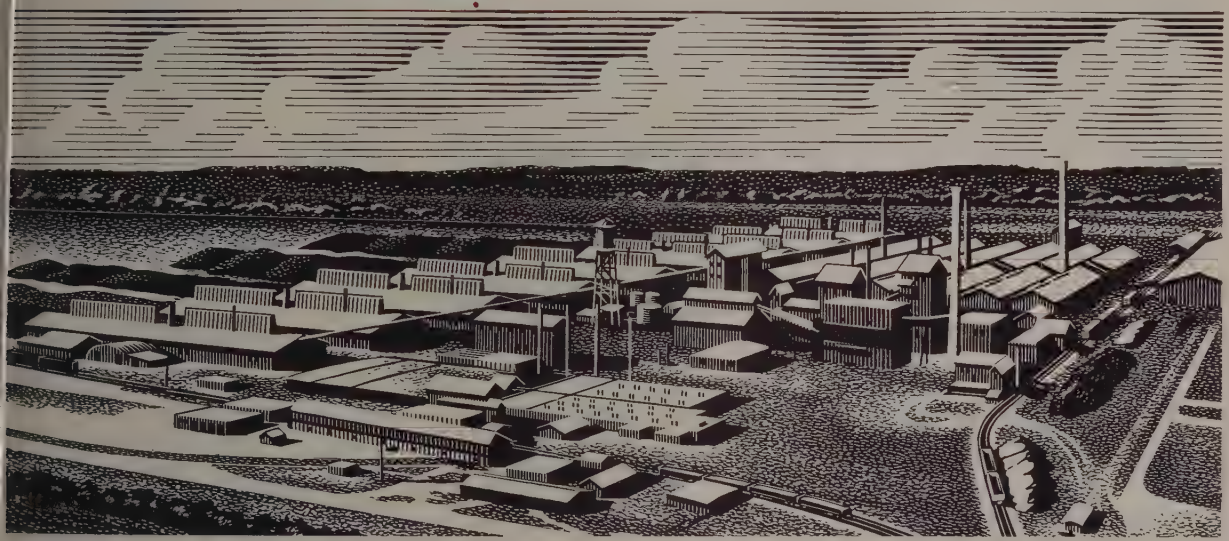
- Kaiser Aluminum & Chemical Corp. will construct an $8-million caustic-chlorine plant next to its proposed alumina plant at Gramercy, La. It will be the first of its kind to be owned and operated by a U. S. producer of aluminum as part of an integrated operation. Gramercy facilities, including alumina and caustic-chlorine plants, will cost some $ million.

- Gazing into a crystal ball, the Magnesium Association reports that this year will see the industry continue to grow. Some reasons: 1. New applications for magnesium in materials handling equipment are being discovered. 2. The use of magnesium in electronics is only beginning to be developed. 3. The potential of magnesium for tools, jigs, fixtures, etc., is just being realized. 4. Uses in the graphic arts are multiplying

American Zinc and its products

from A *to* Z





SMELTER AT
DUMAS, TEXAS

Dumas is one of the larger horizontal retort furnace plants in the United States. Here are produced Prime Western, Select, Brass Special and Intermediate grades of slab zinc for the galvanizing and brass industries. Roasting and sintering operations are also carried on at Dumas, making this plant an important factor in the widespread American Zinc picture.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD-FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

Distributors for

American Zinc sales Company

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 24.40, pigs 22.50. 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.20; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80; No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest: customer smelters, 50.00-50.25 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$120 nom, per troy oz.

Lead: Common, 15.80, chemical, 15.90, corroding, 15.90, St. Louis, New York basis, add 0.20.

Lithium: 99%+, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8% self-palletizing pig, 32.50; notched ingot, 32.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50, AZ91B. 31.00, Madison, Ill.

Mercury: Open market, spot, New York, $275-$279 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, $3-$3.35 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom, per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $97-$117 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $9-$10 per lb.

Silver: Open market, 90.00 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., 103.125; prompt, 103.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.45, grade A-2 (0.5% Fe max), $3.15 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.30 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced $4.85. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade 15.25, deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.00 per lb, depending on quantity; reactor grade, $14.00-$22.00 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 32.00-33.75; No. 12 foundry alloy (No. 2 grade) 31.00-31.25; 5% silicon alloy, 0.60 Cu max, 32.50-32.75; 13 alloy, 0.60 Cu max, 32.50-32.75; 195 alloy, 32.50-32.75; 108 alloy 31.00. Steel deoxidizing grades notch bars, granulated or shot: Grade 1, 31.00-32.25; grade 2, 30.00-31.25; grade 3, 29.50-30.50; grade 4, 29.00-29.75.

Brass Ingot: Red brass No. 115, 42.00; tin bronze No. 225, 56.00; No. 245, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 33.25; manganese bronze No. 421, 37.75.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l. 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $13.10-$13.60; sheared mill plate, $10.50-$12.00; strip, $13.10-$13.60; wire, $9.50-$11.50; forging billets, $7.90-$8.15; hot-rolled and forged bars, $7.90-$8.15.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00-24.00; ribbon zinc in coils, 20.50-21.50; plates, 20.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	153
Shot, Blocks	...	71	...

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

ALUMINUM

Sheet and Circles: 1100 and 3003 mill fin (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coil Sheet Circ
0.249-0.136	37.5	42.3	...	..
0.135-0.096	38.0	43.2	...	..
0.095-0.077	38.7	44.2	36.1	41.
0.076-0.061	39.3	45.1	36.3	41.
0.060-0.048	39.9	45.6	36.7	42.
0.047-0.038	40.4	46.5	37.2	42.
0.037-0.030	40.8	47.0	37.6	43.
0.029-0.024	41.4	47.5	37.9	43.
0.023-0.019	42.2	49.0	38.5	44.
0.018-0.017	43.0	...	39.4	45.
0.016-0.015	43.9	...	40.2	46.
0.014	44.9	...	41.2	47.
0.013-0.012	46.1	...	41.9	48.
0.011	47.1	...	43.1	50.
0.010-0.0095	48.4	...	44.3	52.
0.009-0.0085	49.7	...	45.8	54.
0.008-0.0075	51.3	...	47.0	56.
0.007	52.8	...	43.5	58.
0.006	54.4	...	49.9	63.

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Ba
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 lengths.

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.1 in specific lengths 36-144 in., diameters 0.37 8 in. Rectangles and squares, Class 1, 43.0 56.20 in random lengths, 0.375-4 in. thic widths 0.750-10 in.

Pipe: ASA Schedule 40, alloy 6063-T6, 20- lengths, plain ends, 90,000-lb base, per 100 f

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$16.85	2	$ 51.9
1	26.50	4	143.0
1¼	35.85	6	256.7
1½	42.90	8	386.3

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in 99.00; 0.064 in., 78.00; 0.125 in., 63.50, 30,00 lb and over, f.o.b. mill.

Plate: AZ31, 61.00, 30,000 lb or more, 0.25 in. and over, widths 24-60 in., lengths 72-18 in., tread plate, 64.00, 30,000 lb or more, ¾ in. thick, widths 24-60 in., lengths 60-192 in. tooling plate 66.00, 30,000 lb or more, 0.250 3.000 in., widths 60-72 in., lengths 72-180 in

Extrusions: AZ31 commercial grade, rectan gles, ¼ x 2 in., 64.70; 1 x 4 in., 69.50. Rod 1 in., 61.50; 2 in., 59.00. Tubing, 1 in. OI x 0.065 in., 82.50. Angles, 1 x 1 x ⅛-in. 68.40; 2 x 2 x ¼-in., 62.50. Channels, 4 in., 63.40. I-beams, 5 in., 62.70.

NONFERROUS SCRAP

DEALERS BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 21.00-21.50; old sheets 17.50-18.00; borings and turnings, 11.50-12.00; crankcases, 17.50-18.00; industrial castings 17.50-18.00.

Copper and Brass: No. 1 heavy copper and wire, 41.00-41.50; No. 2 heavy copper and wire, 37.00-37.50; light copper, 35.00-35.50 No. 1 composition red brass, 32.50-33.00; No. 1 composition turnings, 31.50-32.00; yellow

BRASS MILL PRICES

	MILL PRODUCTS a			SCRAP ALLOWANCES		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turning
Copper	63.13-64.13b	60.36-61.36c	....	63.32-64.32	39.000	39.000	38.250
Yellow Brass	52.27-53.60	42.81-43.80d	52.81-54.14	55.18-56.51	29.250	29.000	27.125
Low Brass, 80%	56.55-57.75	56.49-57.69	57.09-58.29	59.36-60.56	34.375	34.125	33.625
Red Brass, 85%	58.09-59.24	58.03-59.18	58.63-59.78	60.90-62.05	34.250	34.000	33.500
Com. Bronze, 90%	60.18-61.28	60.12-61.22	60.72-61.82	62.74-63.84	35.750	35.500	35.000
Manganese Bronze	59.37-60.92	53.38-54.86	63.82	....	27.500	27.250	26.750
Muntz Metal	53.74-55.14	49.55-50.95	....	....	27.375	27.125	26.625
Naval Brass	55.63-57.10	49.94-51.41	62.69-64.16	58.79-60.26	27.125	26.875	26.375
Silicon Bronze	66.54	65.73	66.58	68.68e	37.875	37.625	37.875
Nickel Silver, 10%	66.00-67.25	68.33g	68.33	....	32.750	32.500	16.375
Phos. Bronze, A, 5%	80.99-82.52	81.49-83.02	81.49-83.02	82.67-84.20	39.750	39.500	38.500

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. When price spread exists, we quote the upper range. g. Leaded

ss turnings, 16.50-17.00; new brass clips, 27.50-28.00; light brass, 19.00-19.50; vy yellow brass, 22.50-23.00; new brass ends, 26.00-26.50; auto radiators, unated, 25.00-25.50; cocks and faucets, 25.00-50 brass pipe 25.00-25.50.

d: Heavy, 12.75-13.25; battery plates, 7.00-5; linotype and stereotype, 14.00-14.50; electype, 13.25-13.75; mixed babbitt, 15.50.

gnesium: Clippings, 18.50-19.50; clean cast-s, 18.00-19.00; iron castings, not over 10% novable Fe, less full deduction for Fe, 16.00-.00.

nel: Clippings, 60.00-65.00; old sheets, 00-65.00; turnings, 50.00; rods, 59.50-65.00.

kel: Sheets and clips, 100.00-150.00; rolled odes, 100.00-150.00; turnings, 85.00-125.00; ends, 100.00-150.00.

c: Old zinc, 6.00-6.50; new die-cast scrap, 0; old die-cast scrap, 3.50.

REFINER'S BUYING PRICES

ents per pound, carlots, delivered refinery)

uminum: 1100 clippings, 23.5; 3003 clipgs, 23.25-23.50; 6151 clippings, 22.50-23.50; 52 clippings, 23.00-23.50; 2014 clippings, .50-23.00; 2017 clippings, 22.50-23.00; 2024 ppings, 22.50-23.00; mixed clippings, 22.50-.00; old sheet, 18.50-19.50; old cast, 19.50-.50; clean old cable (free of steel), 23.50; rings and turnings, 20.50-21.50.

ryllium Copper: Heavy scrap, 0.020-in. and avier, not less than 1.5% Be, 54.00; light rap, 49.00; turnings and borings, 34.00-39.00.

pper and Brass: No. 1 heavy copper and re, 41.50; No. 2 heavy copper and wire, .00; light copper 37.75; refinery brass (60% pper) per dry copper content, 38.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 41.50; No. 2 heavy copper and wire, 0.00; light copper, 37.75; No. 1 composition borings, 33.50; No. 1 composition solids, 34.50; navy yellow brass solids, 23.50; yellow brass turnings, 22.50; radiators, 26.50.

PLATING MATERIAL

F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 59.79-60.79 oval 58.92, 5000-10,000 lb; electrodeposited, 57.75, 2000-5000 lb lots; cast 59.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.225; 200-499 lb, $1.210; 500-999 lb, $1.205; 1000 lb or more, $1.200.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 85.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 3300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 86.875; 16-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

Sodium Stannate: Less than 100 lb, 73.30; 100-600 lb, 64.70; 700-1900 lb, 62.20; 2000-9900 lb, 60.50; 10,000 lb or more, 59.30.

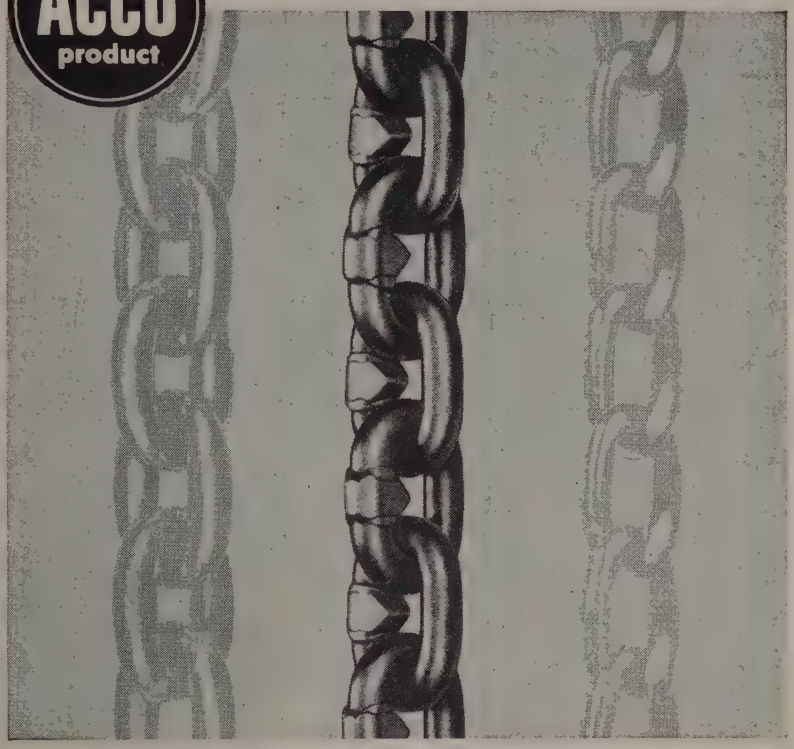
Stannous Chloride (anhydrous): Less than 25 lb, $1.708; 25 lb, $1.358; 100 lb, $1.208; 400 lb, $1.183; 5200-19,600 lb, $1.061; 20,000 lb or more, 94.00.

Stannous Sulphate: Less than 50 lb, $1.333; 50 lb, $1.033; 100-1900 lb, $1.013; 2000 lb or more, 99.30.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

an ACCO product

American Chain



ACCO's Great New Chain . . .

ACCOLOY X-WELD 125

. . . the Chain that Identifies Itself

You can spot it instantly! Even in the company of other fine AMERICAN-made chains, the great new **Accoloy X-Weld 125** chain identifies itself on sight by its unique link formation. Each link's big, outsize welded area is 2¼ times that of links welded by other processes.

Accoloy X-Weld 125 has welds as strong or stronger than the alloy material . . . welds whose projecting lugs prevent dangerous kinking of the chain. These chains hang straight as a die. And they have greater strength with less weight!

These great chains—in ¼", ⅜", ½", ⅝" and ¾" sizes—are ideal for slings, bundling, towing, general utility chains. Write American Chain Division, York, Pa., for descriptive bulletin.

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TRADE MARK

American Chain Division
AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

Better Value

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 127. Key to footnotes, Page 129.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)

Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall,Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$68.50
Bessemer,Pa. U5 .....68.50
Bridgeport,Conn. N19 ..73.50
Buffalo R2 .....68.50
Clairton,Pa. U5 .....68.50
Ensley,Ala. T2 .....68.50
Fairfield,Ala. T2 .....68.50
Fontana,Calif. K1 ....76.00
Gary,Ind. U5 .....68.50
Johnstown,Pa. B2 ....68.50
Lackawanna,N.Y. B2 ..68.50
LoneStar,Tex. L6 ....74.50
Munhall,Pa. U5 .....68.50
Pittsburgh J5 .....68.50
S.Chicago,Ill. R2, U5..68.50
S.Duquesne,Pa. U5 ....68.50
Youngstown R2 .....68.50

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$84.50
Bessemer,Pa. U5 .....84.50
Bridgeport,Conn. N19. 89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3...89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana,Calif. K1 .....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houston S5 .....89.50
Johnstown,Pa. B2 ....84.50
Lackawanna,N.Y. B2...84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14..84.50
S.Duquesne,Pa. U5 ...84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 ....96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ...96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2,W14 ...103.50
S.Duquesne,Pa. U5 ...103.50

SKELP

Aliquippa,Pa. J5 ....4.325
LoneStar,Tex. L6 ....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ..4.225

WIRE RODS

AlabamaCity,Ala. R2 ..5.375
Aliquippa,Pa. J5 .....5.375
Alton,Ill. L1 .....5.55
Buffalo B11 .....5.025
Buffalo W12 .....5.375
Cleveland A7 .....5.375
Donora,Pa. A7 .....5.375
Fairfield,Ala. T2 ....5.375
Houston S5 .....5.275
IndianaHarbor,Ind. Y1.5.025
Johnstown,Pa. B2 ....5.375
Joliet,Ill. A7 .....5.375
KansasCity,Mo. S5 ...5.275
Kokomo,Ind. C16 .....5.475
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ..5.275
Monessen,Pa. P7 .....5.375
N.Tonawanda,N.Y. B11.5.025
Pittsburg,Calif. C11 ...5.675
Portsmouth,O. P12 ....5.375
Roebling,N.J. R5 .....5.475
S.Chicago,Ill. R2 .....5.375
SparrowsPoint,Md. B2..5.475
Sterling,Ill.(1) N15 ....5.375
Sterling Ill. N15 .....5.475
Struthers,O. Y1 .....5.025
Worcester,Mass. A7 ..5.675

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala. T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....5.10
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 ....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown,Pa. B2 ....4.65
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....5.25
Portland,Oreg. O4 ....5.35
Phoenixville,Pa. P4 ....5.15
Seattle B3 .....5.35
S.Chicago U5, W14 ....4.60
S.SanFrancisco B3 ....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 ....4.60

Wide Flange

Bethlehem,Pa. B2 .....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 .....5.40
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
Phoenixville,Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes

Clairton,Pa. U5 .....5.65
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....5.65
Houston S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.75
Johnstown,Pa. B2 ....6.80
KansasCity,Mo. S5 ....6.85
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 ....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.80
Lackawanna,N.Y. B2 ..6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES

Bethlehem,Pa. B2 .....4.65
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ...5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland,Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport,Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa. U5 .....4.50
Claymont,Del. C22 .....4.80
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 ....4.80
Conshohocken,Pa. A3 ...4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 ....4.70
Harrisburg,Pa. P4 .....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1.4.50
Johnstown,Pa. B2 .....4.50
Lackawanna,N.Y. B2 ...4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa,Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.725
Seattle B3 .....5.40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14.4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ....4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 ....4.50
Youngstown R2, U5, Y1.4.50

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 .....5.65
Fontana,Calif. K1 .....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 .5.65

PLATES, Wrought Iron

Economy,Pa. B14 .....10.40

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.725
Bessemer,Ala. T2 ....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 .....6.725
Claymont,Del. C22 ....6.725
Coatesville,Pa. L7 .....7.025
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1 .7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 ....6.725
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago,Ill. U5, W14.6.725
SparrowsPoint,Md. B2..6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy

Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 .....6.30
Coatesville,Pa. L7 .....6.30
Fontana,Calif. K1 .....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES

Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. P4 ....5.575
Ind.Harbor,Ind. I-2 ...5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 ....5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10...4.75
Ashland l.c.l. (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 .....5.10

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala.(9) R2 ....4.65
Aliquippa,Pa.(9) J5 ....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala.(9) T2....4.65
Birmingham C15 .....5.15
Bridgeport,Conn. N19 ..4.80
Buffalo(9) R2 .....4.65
Canton,O.(9) R2 .....4.75
Clairton,Pa.(9) U5 ....4.65
Cleveland(9) R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala.(9) T2 ....4.65
FairlessHills,Pa.(9) U5..4.80
Fontana,Calif. K1 .....5.35
Gary,Ind.(9) U5 .....4.65
Houston S5 .....4.90
Ind.Harbor,Ind.(9) I-2..4.65
Ind.Harbor,Ind. Y1 ....4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....5.15
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.35
Massillon,O.(9) R2 ....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.80
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.35
N.Tonawanda,N.Y. B11 .4.65
Pittsburg,Calif.(9) C11..5.35
Pittsburgh(9) J-5 .....4.65
Portland,Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago W14 .....4.65
S.Chicago,Ill.(9) R2, U5 4.65
S.Duquesne,Pa.(9) U5...4.65
S.SanFran.,Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif.(9) C11 ..5.35
Warren,O.(9) R2 .....4.65
Weirton,W.Va.(9) W6 ..4.65
Youngstown(9) R2 .....4.65
Youngstown(9) U5 .....4.65

BARS, H.R. Leaded Alloy

Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.575
Bridgeport,Conn. N19..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 .....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fontana,Calif. K1 .....6.625
FairlessHills,Pa. U5 ...5.725
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2, Y1.5.575
Johnstown,Pa. B2 .....5.575
KansasCity,Mo. S5 ....5.825
Lackawanna,N.Y. B2 ..5.575
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland,Pa. C18 .....5.575
S.Chicago R2, U5, W14.5.575
S.Duquesne,Pa. U5 ....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....7.05
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 ....6.80
S.SanFrancisco B3 ....7.55
Struthers,O. Y1 .....6.80
Warren,O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.
SanFrancisco S7 .....5.

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.
Gary,Ind. U5 .....5.
Houston S5 .....5.
KansasCity,Mo. S5 ....5.
Youngstown U5 .....5.

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 ....8.1
Camden,N.J. P13 .....8.
Chicago W18 .....8.1
Cleveland C20 .....8.3
Monaca,Pa. S17 .....8.3
Newark,N.J. W18 .....8.
SpringCity,Pa. K3 .....8.
Warren,O. C17 .....8.3

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.2
BeaverFalls,Pa. M12,R2 6.2
Buffalo B5 .....6.3
Camden,N.J. P13 .....6.7
Carnegie,Pa. C12 .....6.2
Chicago W18 .....6.2
Cleveland A7, C20 .....6.2
Detroit R7 .....5.
Detroit B5 .....6.4
Detroit P17 .....6.2
Donora,Pa. A7 .....6.2
Elyria,O. W8 .....5.
FranklinPark,Ill. N5 ...6.2
Gary,Ind. R2 .....6.2
GreenBay,Wis. F7 .....5.
Hammond,Ind. L2, M13..6.2
Hartford,Conn. R2 .....6.7
Harvey,Ill. B5 .....6.2
LosAngeles S30 .....7.
LosAngeles R2 .....7.7
Mansfield,Mass. B5 ...6.8
Massillon,O. R2, R8 ...6.2
Midland,Pa. C18 .....6.2
Monaca,Pa. S17 .....6.2
Newark,N.J. W18 .....6.7
NewCastle,Pa.(17) B4..6.2
Pittsburgh J5 .....6.2
Plymouth,Mich. P5 ....6.5
Putnam,Conn. W18 ....6.8
Readville,Mass. C14 ...6.8
S.Chicago,Ill. W14 ....6.2
SpringCity,Pa. W3 ....6.7
Struthers,O. Y1 .....5.
Waukegan,Ill. A7.....6.2
Worcester,Mass. W19 ..6.7
Youngstown F3, Y1 ....5.

*Including 0.35c for special quality.

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 .5.1

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....7.42
BeaverFalls,Pa.M12,R2 7.42
Bethlehem,Pa. B2 .....7.42
Buffalo B5 .....7.42
Camden,N.J. P13 .....7.6
Canton,O. T7 .....7.42
Carnegie,Pa. C12 .....7.42
Chicago W18 .....7.42
Cleveland A7, C20 .....7.42
Detroit R7 .....7.42
Detroit B5, P17 .....7.62
Donora,Pa. A7 .....7.42
Elyria,O. W8 .....7.42
Gary,Ind. R2 .....7.42
GreenBay,Wis. F7 .....7.42
Hammond,Ind. L2, M13.7.42
Hartford,Conn. R2 .....7.72
Harvey,Ill. B5 .....7.42
Lackawanna,N.Y. B2 ..7.42
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ...7.72
Massillon,O. R2, R8 ...7.42
Midland,Pa. C18 .....7.42
Monaca,Pa. S17 .....7.42
Newark,N.J. W18 .....7.66
Plymouth,Mich. P5 ....7.62
S.Chicago W14 .....7.42
SpringCity,Pa. K3 .....7.66
Struthers,O. Y1 .....7.42
Warren,O. C17 .....7.42
Waukegan,Ill. A7 .....7.42
Worcester,Mass. A7 ...7.72
Youngstown F3, Y1 ...7.42

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....5.15
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ...5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ...4.80
Fontana,Calif. K1 .....5.35
Ft. Worth,Tex.(42) T4 ..5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

.Harbor,Ind. I-2, Y1.4.65
nstown,Pa. B2 .....4.65
et,Ill. P22 .....5.15
nsasCity,Mo. S5 ....4.90
kawanna,N.Y. B2 ..4.65
Angeles B3 .....5.35
ton,Pa. M18 .....4.80
nequa,Colo. C10 ....5.10
es,Calif. P1 .....5.35
tsburg,Calif. C11 ....5.35
tsburgh J5 .....4.65
tland,Oreg. O4 .....5.40
dSprings,Okla. S5 ..5.15
ttle B3, N14 .....5.40
hicago R2 .....4.65
uquesne,Pa. U5 ....4.65
anFrancisco B3 ....5.40
rrowsPoint,Md. B2 ..4.65
rling,Ill.(1) N15 ....4.65
rling,Ill. N15 .....4.75
uthers,O. Y1 .....4.65
rrance,Calif. C11 ....5.35
ungstown R2, U5, Y1.4.65

RS, Reinforcing
Fabricated; to Consumers)

nstown,Pa. ¼-1" B2.6.15
nsasCity,Kans. S5 ...6.45
kawanna,N.Y. B2 ...6.17
rion,O. P11 .....6.15
tsburgh U8 .....6.17
ttle B3, N14 .....6.60
rrowsPt. ½-1" B2...6.15
lliamsport,Pa. S19 ...6.00

IL STEEL BARS

cagoHts.(3) C2, I-2..4.65
cagoHts.(4) C2, I-2..4.65
.Worth,Tex.(26) T4...5.10
anklin,Pa.(3) F5 .....4.65
anklin,Pa.(4) F5 .....4.65
teyShore,Pa.(4) J8 . 4.65
rion,O.(3) P11 .....4.65
oline,Ill.(3) R2 .....4.65
nawanda(3) B12 ....4.65
nawanda(4) B12 .....5.15
lliamsport,Pa.(3) S19.4.65

RS, Wrought Iron

onomy,Pa.(S.R.)B14 11.50
onomy,Pa.(D.R.)B14 14.30
onomy(Staybolt)B14 14.65
cK.Rks. (S.R.) L5 ..11.50
cK.Rks. (D.R.) L5 ..16.00
cK.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ..4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
FairlessHills,Pa. U5 ...4.375
Fontana,Calif. K1 ....5.075
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2, Y1 4.325
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6 (37) ..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ...4.325
Niles,O. M21 .....4.325
Pittsburg,Calif. C11 ...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 .....4.325
Riverdale,Ill. A1 .....4.55
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
SparrowsPoint,Md. B2 .4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ...4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Niles,O. M21 .....5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1 .....7.20

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.375
Conshohocken,Pa. A3 ..6.425
Dravosburg,Pa. U5 ...6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 .....6.375
FairlessHills,Pa. U5 ...6.425
Fontana,Calif. K1 .....7.125
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1 6.375
Lackawanna(35) B2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 .....6.375
SparrowsPoint(36) B2..6.375
Warren,O. R2 .....6.375
Weirton,W.Va. W6 ....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Ind.Harbor,Ind. I-2....4.575

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
FairlessHills,Pa. U5 ..5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 .....6.425
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....5.525
Ind.Harbor,Ind. I-2, Y1 5.325
Lackawanna,N.Y. B2 .5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.325
Newport,Ky. N9 .....5.325
Pittsburg,Calif. C11 ..6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2 .5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.875
Dravosburg,Pa. U5 ...7.875
Ecorse,Mich. G5 .....7.975
FairlessHills,Pa. U5 ..7.925
Fontana,Calif. K1 ....8.975
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2..7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.825

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky.	A10.6.90	...
Canton,O.	R2....6.10	6.55
Dravosburg	U5 ..6.10	...
Fairfield	T2 .....6.10	...
Gary,Ind.	U5 ....6.10	6.35
Ind.Harbor	I-2 ..6.10	6.35
Kokomo,Ind.	C16.6.20	...
MartinsFry.	W10.6.10	...
Newport,Ky.	N9..6.10	6.35
Pitts.,Calif.	C11..6.85	...
SparrowsPt.	B2..6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry.,O. W10 ....6.35

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....5.85‡
Ashland,Ky. A10 .....5.85†
Canton,O. R2 .....5.85‡
Dover,O. R1 .....5.85†
Dravosburg,Pa. U5 ...5.85†
Fairfield,Ala. T2 .....5.85†
Gary,Ind. U5 .....5.85*
GraniteCity,Ill. G4 ....6.05
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 .....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Pittsburg,Calif. C11 ..6.60*
SparrowsPt.,Md. B2 ..5.85†
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ...5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.575

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2 ..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.25
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.25

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.50
Butler,Pa. A10 (type 2).8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ....5.90
Middletown,O. A10 ....5.90
Niles,O. M21 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee W.Va. F4 ...7.75
Ind.Harbor,Ind. I-2 ....7.75
Yorkville,O. W10 .....7.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 .....6.25
Niles,O. M21 .....6.25
Weirton,W.Va. W6 ....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.65

Key to Producers

1 Acme Steel Co.
3 Alan Wood Steel Co.
4 Allegheny Ludlum Steel
5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
6 American Shim Steel Co.
7 American Steel & Wire Div., U. S. Steel Corp.
8 Anchor Drawn Steel Co.
9 Angell Nail & Chaplet
10 Armco Steel Corp.
11 Atlantic Steel Co.

1 Babcock & Wilcox Co.
2 Bethlehem Steel Co.
3 Beth. Pac. Coast Steel
4 Blair Strip Steel Co.
5 Bliss & Laughlin Inc.
8 Braeburn Alloy Steel
9 Brainard Steel Div., Sharon Steel Corp.
10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
12 Buffalo Steel Corp.
14 A. M. Byers Co.
15 J. Bishop & Co.

1 Calstrip Steel Corp.
2 Calumet Steel Div. Borg-Warner Corp.
4 Carpenter Steel Co.
7 Cleve. Cold Rolling Mills
8 Cold Metal Products Co.
9 Colonial Steel Co.
10 Colorado Fuel & Iron
11 Columbia-Geneva Steel
12 Columbia Steel & Shaft.
13 Columbia Tool Steel Co.
14 Compressed Steel Shaft.
15 Connors Steel Div. H. K. Porter Co. Inc.
16 Continental Steel Corp.
17 Copperweld Steel Co.
18 Crucible Steel Co.
19 Cumberland Steel Co.
20 Cuyahoga Steel & Wire

C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G6 Greer Steel Co.
G5 Great Lakes Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md.Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div. U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division, H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Allenport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.825
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.075
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2, Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
Pittsburg,Calif. C11	5.075
Portsmouth,O. P12	4.325
Riverdale,Ill. A1	4.55
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.85
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.525
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2, Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.30
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7, D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2, T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	6.80
Youngstown C8, Y1	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20
Ind.Harbor,Ind. Y1	9.30
Lackawanna,N.Y. B2	9.10
Sharon,Pa. S3	9.10
SparrowsPoint,Md. B2	9.10
Warren,O. R2	9.10
Weirton,W.Va. W6	9.10
Youngstown Y1	9.30

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.25*
Riverdale,Ill. A1	6.35*
Youngstown C8	6.25*
Warren,O. T5	6.25*
Warren,O. B9	6.45*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.80*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.80	12.95	15.65
Carnegie,Pa. S18	...	9.05	10.60	12.75	....
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	7.20	9.15	10.70	....	....
Detroit D2	7.20	9.15	10.70	12.85	....
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.05	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.80	12.95	15.65
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15	7.10	9.05	10.60	12.75	15.45
NewCastle, Pa. B4, E5	7.10	9.05	10.60	12.75	....
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	....
NewKensington,Pa. A6	7.10	9.05	10.60	....	....
New York W3	...	9.35	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y.(32) R6	7.10	9.05	10.60	12.75	15.45
Sharon,Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton,N.J. R5	...	9.35	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Youngstown C8	...	...	15.00	18.35	22.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. M21	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	...	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80§	13.35§	13.85§	14.85§

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	13.55§
Butler,Pa. A10	....	....	17.45	17.95	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	13.55
Warren,O. R2	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb
Aliquippa,Pa. J5	$7.90	$8.15
Dravosburg,Pa. U5	7.90	8.15
Fairfield,Ala. T2	8.00	8.25
FairlessHills,Pa. U5	8.00	8.25
Gary,Ind. U5	7.90	8.15
GraniteCity,Ill. G4	8.00	8.25
IndianaHarbor,Ind. I-2, Y1	7.90	8.15
Niles,O. R2	7.90	8.15
Pittsburg,Calif. C11	8.65	8.90
SparrowsPoint,Md. B2	8.00	8.25
Weirton,W.Va. W6	7.90	8.15
Yorkville,O. W10	7.90	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)		
Aliquippa,Pa. J5	6.675	....
Niles,O. R2	6.675	6.875

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.20	$9.45
Dravosburg,Pa. U5	9.20	9.45
Fairfield,Ala. T2	9.30	9.55
Fairless,Pa. U5	9.30	9.55
Gary,Ind. U5	9.20	9.45
Ind.Har. I-2, Y1	9.20	9.45
Pitts.,Calif. C11	9.95	10.20
Sp.Pt.,Md. B2	9.30	9.55
Weirton,W.Va. W6	9.20	9.45
Yorkville,O. W10	9.20	9.45

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.00
Dravosburg,Pa. U5	7.00
Fairfield,Ala. T2	7.10
FairlessHills,Pa. U5	7.10
Gary,Ind. U5	7.00
GraniteCity,Ill. G4	7.10
Ind.Harbor,Ind. I-2, Y1	7.00
Niles,O. R2	7.00
Pittsburg,Calif. C11	7.75
SparrowsPoint,Md. B2	..
Warren,O. R2	....
Weirton,W.Va. W6	....
Yorkville,O. W10	....
HOLLOWARE ENAMELING Black Plate (29 Gage)	
Dravosburg,Pa. U5	...
Gary,Ind. U5	....
GraniteCity,Ill. G4	....
Ind.Harbor,Ind. Y1	...
Yorkville,O. W10	....
MANUFACTURING TERNES (Special Coated; Base B	
Dravosburg,Pa. U5	...
Gary,Ind. U5	....
Yorkville,O. W10	....
MANUFACTURING TERNES (Light Coated, 6 lb; Base	
Yorkville,O. W10	....
ROOFING SHORT TERNES (8 lb Coated; Base Box)	
Gary,Ind. U5	$1

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.60
Aliquippa,Pa. J5	6.60
Alton,Ill. L1	6.775
Atlanta A11	6.45
Bartonville,Ill. K4	6.35
Buffalo W12	6.60
Chicago W13	6.60
Cleveland A7	6.60
Crawfordsville,Ind. M8	6.70
Donora,Pa. A7	6.60
Duluth,Minn. A7	6.60
Fairfield,Ala. T2	6.60
Fostoria,O.(24) S1	6.80
Houston S5	6.50
Jacksonville,Fla. M8	6.95
Johnstown,Pa. B2	6.60
Joliet,Ill. A7	6.60
KansasCity,Mo. S5	6.50
Kokomo,Ind. C16	6.70
LosAngeles B3	7.55
Minnequa,Colo. C10	6.50
Monessen,Pa. P7	6.60
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.25
Palmer,Mass. W12	6.90
Pittsburg,Calif. C11	7.20
Portsmouth,O. P12	6.60
Rankin,Pa. A7	6.60
S.Chicago,Ill. R2	6.60
S.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.70
Sterling,Ill.(1) N15	6.60
Sterling,Ill. N15	6.70
Struthers,O. Y1	6.25
Waukegan,Ill. A7	6.60
Worcester,Mass. A7	6.90

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7
Buffalo W12	
Cleveland A7	
Donora,Pa. A7	
Duluth,Minn. A7	
Johnstown,Pa. B2	
KansasCity,Mo. S5	
LosAngeles B3	
Minnequa,Colo. C10	7
Monessen,Pa. P16	
NewHaven,Conn. A7	
Palmer,Mass. W12	
Pittsburg,Calif. C11	
Portsmouth,O. P12	
Roebling,N.J. R5	
S.Chicago,Ill. R2	
S.SanFrancisco C10	
SparrowsPoint,Md. B2	
Struthers,O. Y1	
Trenton,N.J. A7	
Waukegan,Ill. A7	
Worcester,Mass. A7	

WIRE, Fine & Weaving (8"Co

Alton,Ill. L1	12
Bartonville,Ill. K4	1
Buffalo W12	1
Chicago W13	1
Cleveland A7	1
Crawfordsville,Ind. M8	1
Fostoria,O. S1	1
Jacksonville,Fla. M8	1
Johnstown,Pa. B2	1
Kokomo,Ind. C16	1
Minnequa,Colo. C10	1
Monessen,Pa. P6	1
Muncie,Ind. I-7	1
Palmer,Mass. W12	1
Roebling,N.J. R5	1
S.SanFrancisco C10	1
Waukegan,Ill. A7	1
Worcester,Mass. A7,T6	1

WIRE, Gal'd ACSR for Core

Bartonville,Ill. K4	10
Buffalo W12	10
Johnstown,Pa. B2	10
Minnequa,Colo. C10	10
Monessen,Pa. P16	10
Muncie,Ind. I-7	10
Pittsburg,Calif. C11	11
Portsmouth,O. P12	10
Roebling,N.J. R5	11
SparrowsPt.,Md. B2	10

ROPE WIRE

Bartonville,Ill. K4	10
Buffalo W12	10
Fostoria,O. S1	10
Johnstown,Pa. B2	10
Monessen,Pa. P16	10
Muncie,Ind. I-7	10
Palmer,Mass. W12	10
Portsmouth,O. P12	10
Roebling,N.J. R5	10
SparrowsPt. B2	10
Struthers,O. Y1	10
Worcester,Mass. J4	10

(A) Plow and Mild Plow add 0.25c for Improved Plow

WIRE
(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	9.00
Baltimore T6	9.30
Buffalo W12	9.00
Cleveland A7	9.00
Crawfordsville,Ind. M8	9.00
Dover,O. G6	9.00
Fostoria,O. S1	9.00
FranklinPark,Ill. T6	9.10
Kokomo,Ind. C16	9.00
Massillon,O. R8	9.00
Milwaukee C23	9.20
Monessen,Pa. P16	9.00
Pawtucket,R.I. N8	9.30
Riverdale,Ill. A1	9.10
Rome,N.Y. R6	9.00
Trenton,N.J. R5	9.30
Worcester A7, T6, W12	9.30

NAIL, Stock

To Dealers & Mfrs. (7) Col.	
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla.(23) M8	162
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	9.05
Wheeling,W.Va. W10	9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7) Col.	
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Jack'ville,Fla.(23) M8	162
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	9.35
Bartonville,Ill. K4	9.45
Buffalo W12	9.35
Crawfordsville,Ind. M8	9.45
Donora,Pa. A7	9.35
Duluth,Minn. A7	9.35
Jacksonville,Fla. M8	9.88
Johnstown,Pa. B2	9.35
Joliet,Ill. A7	9.35
Kokomo,Ind. C16	9.45
LosAngeles B3	10.14
Minnequa,Colo. C10	9.60
Pittsburg,Calif. C11	10.13
S.Chicago,Ill. R2	9.35
SparrowsPt.,Md. B2	9.45
Sterling,Ill. N15	9.35

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	9.65
Bartonville,Ill. K4	9.75
Buffalo W12	9.65
Crawfordsville,Ind. M8	9.75
Donora,Pa. A7	9.65
Duluth,Minn. A7	9.65
Jacksonville,Fla. M8	10.18
Johnstown,Pa. B3	9.65
Joliet,Ill. A7	9.65
Kokomo,Ind. C16	9.75
LosAngeles B3	10.45
Minnequa,Colo. C10	9.90
Pittsburg,Calif. C11	10.45
S.Chicago,Ill. R2	9.65
SparrowsPt.,Md. B2	9.75
Sterling,Ill. N15	9.65

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	9.70
Bartonville,Ill. K4	9.80
Buffalo W12	9.70
Crawfordsville,Ind. M8	9.80
Donora,Pa. A7	9.70
Duluth,Minn. A7	9.70
Jacksonville,Fla. M8	10.23
Johnstown,Pa. B2	9.70
Joliet,Ill. A7	9.70
Kokomo,Ind. C16	9.80
LosAngeles B3	10.50
Minnequa,Colo. C10	9.95
Pittsburg,Calif. C11	10.50
S.Chicago,Ill. R2	9.70
SparrowsPt.,Md. B2	9.80
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	175**
Aliquippa,Pa. J5	172§
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180†
Jacksonville,Fla. M8	186
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180†
Kokomo,Ind. C16	177†
Minnequa,Colo. C10	180**
Monessen,Pa. P7	178††
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179††

WOVEN Fence, 9-15 ga.

	Col.
Ala.City,Ala. R2	162**
Ala.City, 17 ga. R2	257**
Ala.City, 18 ga. R2	267**
Aliq'ppa,Pa.9-14½ga J5	165§
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167†
Jacksonville,Fla. M8	173
Johnstown,Pa.(43) B2	166
Joliet,Ill. A7	162†
KansasCity,Mo. S5	167†
Kokomo,Ind. C16	164†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P17	166††
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166††

	An'ld Galv.	Stone
WIRE (16 Gage)	**Stone**	
Ala.City R2	14.50	16.05**
Bartonville K4	14.60	16.55
Buffalo W12	14.50	....
Cleveland A7	14.50	....
Crawf'dsville M8	14.60	16.55
Fostoria,O. S1	14.60	16.15†
Jacksonville M8	14.85	16.80
Johnstown B2	14.50	16.40*
Kokomo C16	14.60	16.15†
Minnequa C10	14.75	16.45**
Palmer,MassW12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50-16.45	††
Waukegan A7	14.50	16.05†
Worcester A7	14.80	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.	
Ala.City,Ala. R2	7.40	7.80**
Aliquippa J5	7.40	7.925§
Atlanta A11	7.50	8.10
Bartonville(48) K4	7.50	8.10
Buffalo W12	7.40	8.80†
Cleveland A7	7.40	....
Crawfordsville M8	7.50	8.10
Donora,Pa. A7	7.40	7.80†
Duluth,Minn. A7	7.40	7.80†
Fairfield T2	7.40	7.80†
Houston,Tex. S5	7.65	8.05†
Jacks'ville,Fla. M8	7.75	8.35
Johnstown B2(48)	7.40	7.975*
Joliet,Ill. A7	7.40	7.80†
KansasCity,Mo. S5	7.65	8.05†
Kokomo C16	7.50	7.90†
LosAngeles B3	8.35	8.925*
Minnequa C10	7.65	8.05**
Monessen P7(48)	7.40	8.00††
Palmer,Mass. W12	7.70	8.10†
Pitts.,Calif. C11	8.35	8.75†
Portsmouth,O. P12	7.40	....
Rankin A7	7.40	7.80†
S.Chicago R2	7.40	7.80**
S.SanFran. C10	8.35	8.75**
Spar'wsPt.B2(48)	7.50	8.075*
Str'lng(1)(48)	N15 7.40	8.00††
Struthers,O.(48)	Y1 7.40	7.90‡
Worcester,Mass.	A7 7.70	....

*Based on 12.50c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	173
Atlanta A11	175
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth,Minn. A7	173
Fairfield,Ala. T2	173
Jacksonville,Fla. M8	180
Joliet,Ill. A7	173
Houston S5	178
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
S.Chicago R2	173
S.SanFran.,Calif. C10	197
SparrowsPoint,Md. B2	175
Sterling,Ill.(1) N15	173

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	157
Johnstown,Pa. B2	157
Marion,O. P11	157
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	157
Williamsport,Pa. S10	160

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts

Full-Size Body (cut thread)

†½" x 6" and smaller	61
Larger than ½" diam. and all diams. longer than 6"	55
Under-Size Body (rolled thread; not nutted): ½" x 6" and smaller.	61

†½" x 4" and smaller and shorter are not nutted.

Carriage, Machine & Lag Bolts, Hot Galvanized:

½" and smaller	42
Larger than ½" diam. and all diams. longer than 6"	32

Lag Bolts

All diams. & 6" and shorter	61
All diams. longer than 6"	55

Plow, Tap & Blank Bolts

½" x 6" and smaller.	61
Larger than ½" diam. and all diams. longer than 6"	55

Ribbed Neck, Carriage, Step, Elevator, Fitting-up and Tire Bolts:

All sizes	61

STOVE BOLTS, SLOTTED (nuts not attached; bulk)

⅛" to ¼" diam. incl., 3" or shorter:	
25,000 to 199,999 pieces	61
200,000 or more pieces	64
⅝" to ½" diam. incl., 3" or shorter:	
15,000 to 99,999 pieces	61
100,000 or more pieces	64
Longer than 3", any diam.:	
5000 to 99,999 pieces	61
100,000 or more pieces	64

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.95

⅞-in. under..List less 32%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.06	20.42
1¼	13	....	24.94	20.45
1½	13	23.31	27.57	22.61
1¾	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2¼	12	37.73	44.63	36.60
2½	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.55

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	....	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	4.625	4.675	....
Huntington,W.Va. W7	....	....	....	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	....
Johnstown,Pa. B2	....	....	...(16)	5.65
Lackawanna,N.Y. B2	4.725	4.625	...(16)	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	....
Williamsport,Pa. S19	....	....	....	5.65

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torrance,Calif. C11	5.775

TRACK BOLTS (20) Treated

Cleveland R2	12.90
KansasCity,Mo. S5	12.40
Lebanon,Pa. B2	12.15*
Minnequa,Colo. C10	12.40
Pittsburgh O3, P14	12.15*
Seattle B3	12.65*

*Untreated

AXLES

Ind.Harbor,Ind. S13	7.25
Johnstown,Pa. B2	7.25

JOINT BARS

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.90
Ind.Harbor, Ind. I-2, Y1	7.90
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	7.90
Minnequa,Colo. C10	7.90
Pittsburgh J5	7.90
Seattle B3	8.40
S.Chicago,Ill. R2	7.90
Struthers,O. Y1	7.90
Youngstown R2	7.90

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed.	9.25
Swedish, c.i.f. Camden, N. J., c.l. in bags.	9.50
Domestic, f.o.b., Johnstown, Pa., Riverton, N.J., Niagara Falls, N.Y., in bags	9.50
Canadian, f.o.b. Shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)..	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum: Atomized, 500 lb. drum frght. allowed	
Carlots	34.50
Ton lots	36.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	38.25-52.25†
Bronze, 5000-lb lots	63.75-67.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	59.75-62.50†
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	19.25-33.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.30
Less than 1000 lb	4.45
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni, **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛-in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) To jobbers, 4 cols. lower.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	6.5	..	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	..
Lorain, O. N3	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.25	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	...	...	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+28.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. F6	18	+12.5	9.5	+18	1.5	+26	...	...	...	...	...	...	...	...
Etna, Pa. N2	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless Hills, Pa. N3	...	...	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Fontana, Calif. K1	...	...	....	....	....	....	7	+12.25	10	+8.25	12.5	+4.75	15	+3
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+14.5	7.5	+20	+0.5	+28	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Youngstown R2, Y1	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	...	....	...
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless Hills, Pa. N3	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Fontana, Calif. K1	15.5	+2	16	+1.5	17.5	+0.75	17.5	+0.75	8	+10.75	8	+10.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Sparrows Pt., Md. B2	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Slabs	Ingot	Forging —Billets—	Seamless Tube —Billets—	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	18.50	23.00	....	....	31.00	....	....	....	42.25	39.00
202	19.75	25.50	31.00	36.25	33.50	....	36.75	38.75	42.50	42.50
301	19.25	23.75	....	36.75	32.00	36.00	38.00	....	44.25	41.00
302	20.50	26.25	32.00	37.25	34.50	36.25	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	36.25	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	39.00	41.00	....	....	....
304	21.75	27.50	33.75	39.00	37.25	38.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	43.25	45.25	48.00	52.25	52.25
305	23.25	30.25	....	39.50	40.25	38.25	40.25	43.50	50.25	50.25
308	23.50	30.50	38.50	44.25	41.25	43.25	45.50	49.75	52.00	52.00
309	31.00	39.75	46.75	53.50	53.50	52.00	54.75	58.25	67.00	67.00
310	37.25	48.00	62.25	72.25	68.50	69.75	73.50	75.25	78.75	78.75
314	....	....	....	....	....	69.75	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	57.75	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.50	63.25	62.75	65.75	69.00	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	70.75	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	43.00	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	50.75	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	32.25	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	30.50	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	29.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	29.50	31.00	....	....	....
420	....	30.25	31.00	36.00	37.75	35.50	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	29.50	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	30.00	31.50	....	....	....
431	....	25.50	33.25	....	....	37.25	39.25	40.75	....	....
446	....	....	35.50	40.50	53.25	40.00	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 20%
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base Cold Rolled 10%	Strip, Carbon Base Cold Rolled Both Sides
Copper*	30.00	38.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.6775
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	..	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	54.50	55.00‡	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda,N.Y. W12	58.50	59.00	59.50	60.00
N.Tonawanda,N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester,N.Y. deld.	61.52	62.02	62.52	....
Syracuse,N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary,Ind. U5	58.50	....	59.00	....
S.Chicago R2	58.50	....	59.00	....
S.Chicago,Ill. Y1	58.50	59.00	59.00	59.50
S.Chicago,Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.67
Muskegon,Mich. deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron,O., deld.	61.25	61.75	61.75	62.25
Lorain,O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem,Pa. B2	60.50	61.00	61.50	62.00
NewYork, deld.	....	64.78	65.28	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro,Pa. B10	60.50	61.00	61.50	62.00
Chester,Pa. P14	60.50	61.00	61.50	....
Philadelphia, deld.	62.16	62.66	63.16	....
Steelton,Pa. B2	60.50	61.00	61.50	62.00
Swedeland,Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy,N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
NevilleIsland,Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	60.37	60.37	60.87
McKeesRocks, deld.	....	60.04	60.04	60.54
Lawrenceville,Homestead, Wilmerding, Monaca, deld.	....	60.66	60.66	61.16
Verona,Trafford, deld.	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer,Pa. U5	58.50	....	59.00	59.50
Clairton,Rankin,S.Duquesne,Pa. U5.	58.50	....	....	....
McKeesport,Pa. N3	58.50	....	....	59.50
Midland,Pa. C18	58.50	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,O. Y1	....	....	59.00	....
Sharpsville,Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield,O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie,Pa. I-3	58.50	59.00	59.00	59.50
Everett,Mass. E1	62.00	62.50	63.00	....
Fontana,Calif. K1	64.50	65.00	....	....
Geneva,Utah C11	58.50	59.00	....	....
GraniteCity,Ill. G4	60.40	60.90	61.40	....
Ironton,Utah C11	58.50	59.00	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	60.50	61.00	61.50	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75%; $56, Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$67.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	95.50
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	98.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Rockwood,Tenn. T3 (Phos. 0.0035% max)	72.50
Steelton,Pa. B2 (Phos. 0.035% max)	66.50
Philadelphia, deld.	70.05
Troy,N.Y. R2 (Phos. 0.035% max)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Pittsburgh P6 (Intermediate) (Phos. 0.036-0.075% max)	63.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Buffalo, Chicago, Chattanooga, Cincinnati, Cleveland, Erie, Jackson, Milwaukee, St. Louis, 15 cents; Baltimore, Boston, Los Angeles, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, New York, no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	...	7.42	9.39	....	7.63	7.49	9.48
Baltimore	7.08	8.32	8.50	....	7.65	...	7.66	8.62[3]	13.49	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85	....	7.06	...	7.08	9.35	....	7.28	6.99	9.10
Boston	7.75	8.81	10.27	45.57	7.96	...	7.87	9.53	14.45	8.13	7.89	9.36
Buffalo	7.00	8.05	9.77	....	7.30	...	7.30	7.90	13.10	7.55	7.30	8.55
Chattanooga	6.95	8.10	8.60	....	7.20	...	7.20	9.18	....	7.45	7.25	9.05
Chicago	7.00	8.24	8.65	49.05	7.21	...	7.27	7.75	12.85	7.43	7.14	8.61
Cincinnati	7.12	8.23	9.05	46.10	7.45	...	7.51	8.05	13.09	7.90	7.43	8.86
Cleveland	7.00	8.24	8.95	49.16	7.31	...	7.33	7.85	12.91	7.76	7.31	8.78
Detroit	6.99	8.28	8.78	43.50	7.34	...	7.36	8.04	13.05	7.75	7.27	8.65
Erie, Pa.	7.08	8.24	8.95[10]	....	7.31	...	7.35	8.10[10]	....	7.65	7.30	8.79
Houston	7.85	8.75	10.49	....	8.15	...	8.25	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.10	8.20	9.20	....	7.40	...	7.40	9.44	....	7.60	7.45	9.30
Los Angeles	8.05	10.00	11.00	....	8.35	...	8.05	12.10	14.25	8.30	8.05	10.25
Milwaukee	7.09	8.33	8.74	....	7.30	...	7.36	7.94	12.94	7.60	7.23	8.70
Moline, Ill.	7.15	8.44	8.85	....	7.41	...	7.43	8.10	....	7.63	7.34	...
New York	7.61	8.84	9.59	44.95	8.17	...	8.11	9.58	13.43	8.09	7.86	9.29
Norfolk, Va.	7.25	...	...	....	7.65	...	7.65	9.50	....	7.95	7.45	8.95
Philadelphia	7-19	8.42	9.37	45.98	7.67	9.02	7.68	8.46	13.21	7.74	7.37	8.69**
Pittsburgh	6.80	8.09	9.20	49.00	7.16	...	7.08	7.85	12.85	7.28	6.99	8.46
Portland, Oreg.	7.80	8.80	10.65	....	8.00	...	7.95	12.20	15.00	7.85	7.75	9.60
Richmond, Va.	7.15	...	9.59	....	7.80	...	7.85	9.50	....	8.10	7.35	9.25
St. Louis	7.29	8.53	9.34	43.89	7.50	...	7.56	8.14	13.14	7.83	7.43	8.90
St. Paul	7.46	8.59	9.16	....	7.72	...	7.74	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	...	8.05	11.20	14.25[3]	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65	...	8.40	12.10	14.65	8.30	8.20	10.10
Spokane	8.55	11.00[7]	10.80	....	9.05	...	8.35	11.80	15.35	8.30	8.20	10.60
Washington	7.50	8.79	7.97	....	8.12	...	8.08	9.09	....	8.40	7.68	9.34

Prices do not include gage extras; †prices include gage and coating extras (based on 12.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **⅛-in. and heavier; ††as annealed; §§under ⅛-in.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [2]—500 to 9999 lb; [3]—400 to 999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over; [10]—2000 lb and over.

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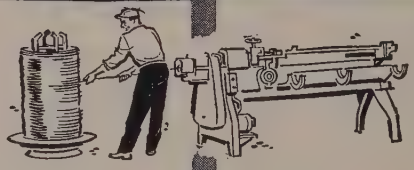

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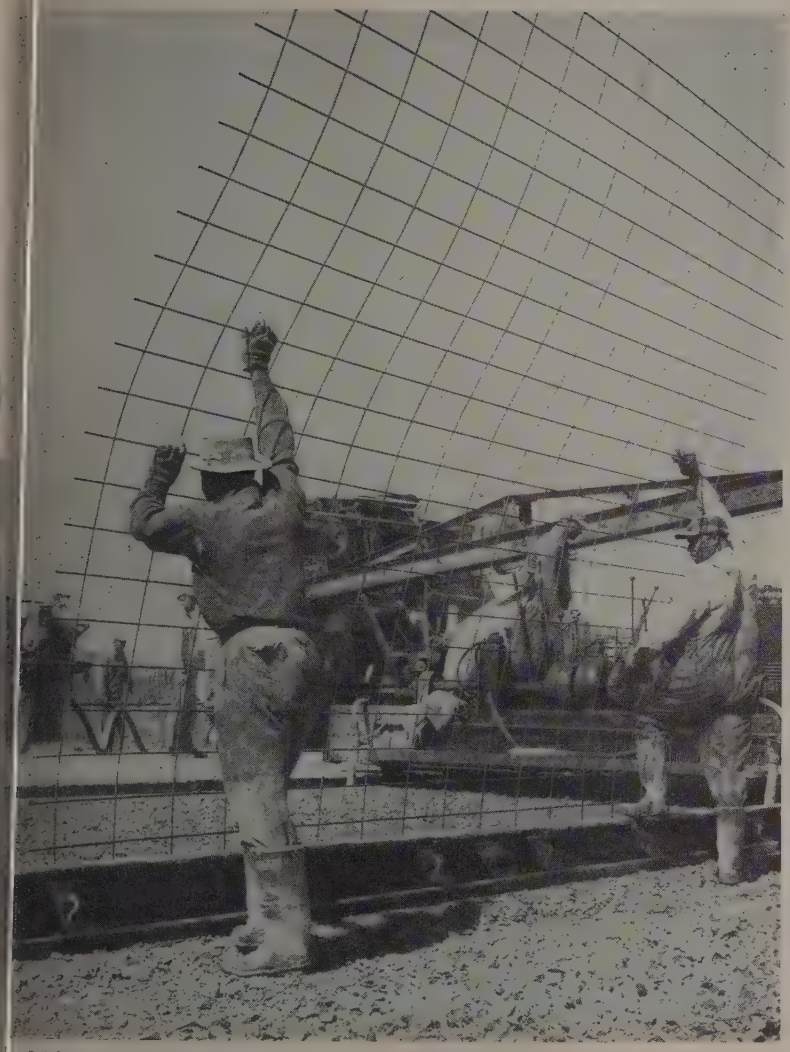

e Reinforcement Institute

Workers prepare to place a sheet of welded wire fabric reinforcement on northeast extension of Pennsylvania Turnpike. Roadbuilding takes 25 per cent of this product

Wire Fabric Rides the Boom

[ANUFACTURERS of welded wire abric are keeping one eye on con-ruction reports and the other on oadbuilding plans. These markets ontrol the sales picture of reinforce-ient fabric.

The industry, made up of about a ozen companies, shipped close to 50,000 tons of wire mesh in 1955, ccording to one producer. Expect-ng to do better this year, they are acking their optimism with capital mprovement. Last year, capacity vas increased by about 27 per cent 165,000 tons) to 700,000 tons. This is sufficient to keep the industry ahead of the heavy demand foreseen for the near future as engineers become more aware of the advantages of reinforcement in roads, buildings and concrete pipe.

Steady Improvement—One of the biggest coming markets, opines the Wire Reinforcement Institute Inc., Washington, is in asphalt concrete road construction. Asphalt used to resurface a damaged portland cement highway has a tendency to crack wherever it covers a rupture. Engineers believe that by reinforcing the asphalt, cracking can be cut to a minimum or eliminated entirely. While tonnage for this use is minor, the institute has reports which indicate the possibility of an upswing.

Some unreinforced concrete runways, ramps and taxiways at Detroit's Willow Run airport were resurfaced last summer. The project engineers are convinced that it is just as desirable to have reinforcing in bituminous resurfacing as it is in concrete pavements. They found that the use of wire fabric does not complicate or slow up the operation.

Bus Stop — In Cleveland, it was found that in spots where public busses made regular stops, the asphaltic pavement has a tendency to "creep" and crack. About a year ago, these spots were resurfaced, incorporating wire mesh reinforcement. Reports indicate complete satisfaction.

The largest market for wire fabric is the building field which consumes about half the annual shipments. Manufacturers are encouraged by reports of record heavy construction anticipated for 1956. But they are also pinning their hopes on the use of reinforcing materials in small homes. In the Washington area, one contractor is building homes with steel-reinforced concrete walls. The method is fast and economical (see STEEL, Aug. 29, 1955, p. 275). The Army is showing an interest in this type house for installation near Nike sites.

Big Portion—Wire fabric manufacturers have been watching the superhighway program closely, not only because highways as such consume about one-fourth of all reinforcing materials but also because of the large volume of reinforced concrete pipe used. This accounts for another one-fourth of the industry's output.

M. E. Capouch, manager of construction materials sales, American Steel & Wire Division, U. S. Steel Corp., says that in the past this industry has been subject to rather severe peaks and valleys in production because of the seasonal nature of construction. In recent years, an educational program has resulted in the year-round purchase of wire mesh by contractors which has leveled the peaks. Because many highway departments are willing to pay the contractor for materials upon delivery, it is possible to stockpile the material. The Wire Reinforcement Institute says it can be stored outdoors for some time without any damage to the steel. There may be

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some rust, but it does not impair t strength of the fabric. In fact, so contractors prefer a little rust, b cause it results in a better bond b tween the concrete and the reinforc ment.

Eight Reasons—Henry Aaron, chi engineer of the institute's Reinforc Concrete Pavement Division, sa that in the final analysis, use of st reinforcement in concrete means d lar savings and better performanc Mr. Aaron points out these adva tages: 1. Distributed steel kee cracks closed. 2. It permits long slabs. 3. It prolongs the serviceab life of concrete slabs. 4. Steel rei forcement reduces pavement defle tions. 5. It provides 30 per ce more strength than equal thickness of unreinforced pavements and a lows a reduction in the volume concrete. 6. It retards the rate cracking. 7. Reinforced concre pavements have smoother riding su faces, cost less to maintain. 8. Th small initial cost of reinforcement justified by the above.

Mr. Aaron says that about 90 p cent of all pavement uses of ste reinforcement are welded wire fabri

Sheets, Strip . . .

Sheet & Strip Prices, Pages 127 & 128

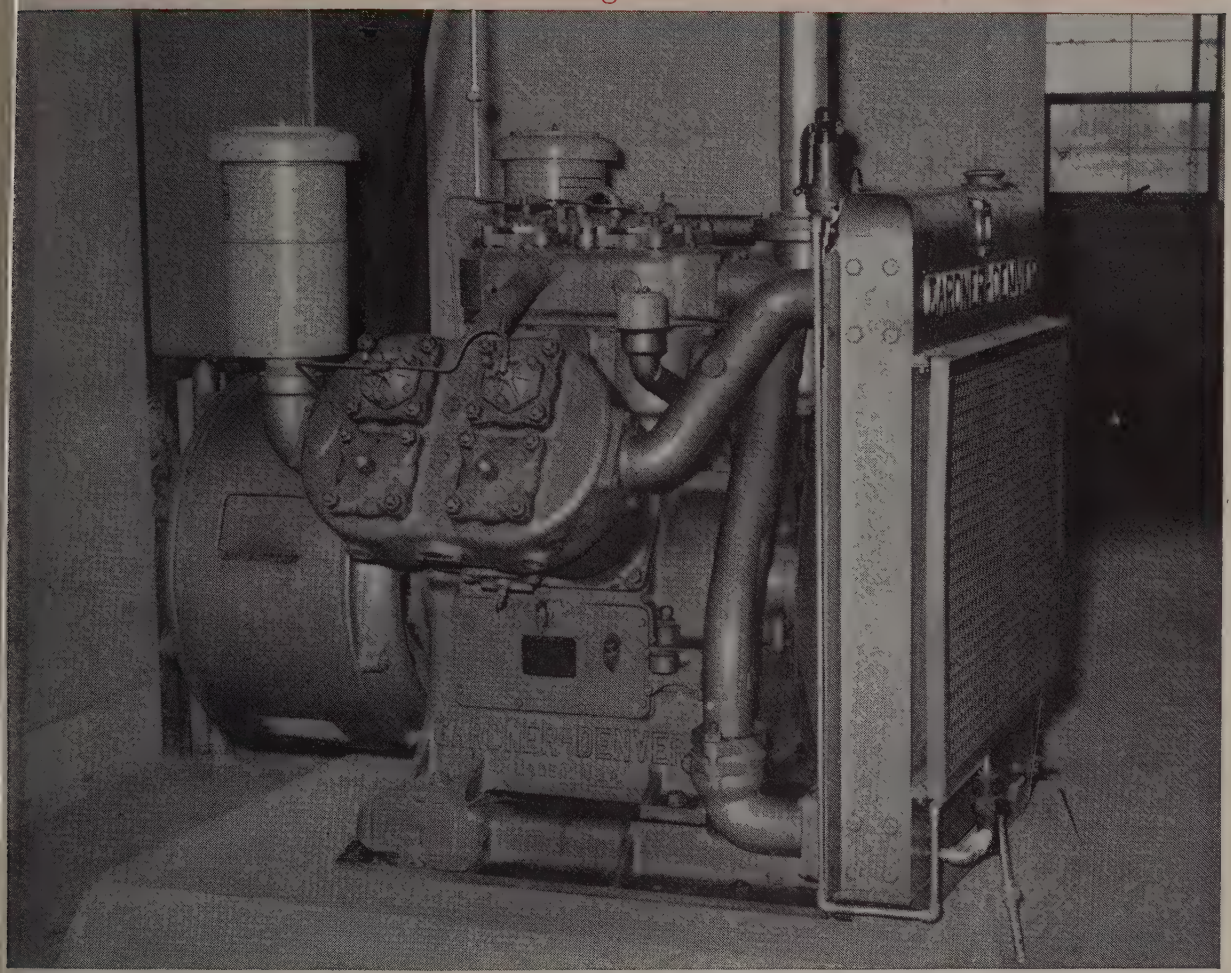
Sheet producers warn against a taching too much importance to th recent "temporary flutter" in the au tomotive industry's demand for stee Although automotive cutbacks hav brought an end to conversion deal and wild clamoring for sheet, mill continue to plan peak operation through March.

The reduction in auto assemblie is not being translated into cancel lations or delivery deferments a the mill level in sufficient volume t release sheets for other users. Bu sheetmakers are being pressed fro all quarters by customers who wan a share of whatever may be release in the near future.

Pittsburgh Steel Co. officials ex pect to operate at capacity well int the third quarter. Leading execu tives of U. S. Steel expect no declin in steel consumption below presen levels during the first half of th year. Similar optimistic forecast have been made by officials of othe steel producing firms. Most of them base their opinion on the belief that if any decline in consumption occurs it will be offset by rebuilding of stee inventories to more comfortable working levels.

Some sheet producers are opening

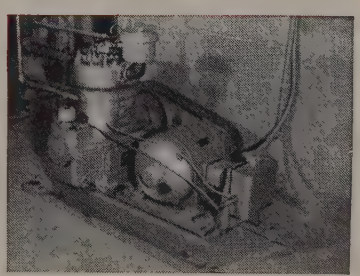
Gardner-Denver... Serving the World's Basic Industries



Moves in fast . . . starts right away . . .
Gardner-Denver WB Compressor

It's as easy as it looks in this picture to install a Gardner-Denver WB Compressor. Hook up the wiring . . . air line . . . controls—that's about all there is to it. Not much of a foundation is needed—because vibration has been designed out of the machine. The packaged unit has a built-in motor, and a self-contained radiator-intercooler that solves cooling-water problems.

Available in seven sizes from 142 to 686 cfm. Write for Bulletin WB-10, with full specifications.



Another popular Gardner-Denver compressor—noted for long, steady runs—the model AA. Bulletin AA6.

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THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

second quarter books for a month at a time, instead of for the entire period as before, to keep closer control on commitments. This applies to hot and cold-rolled sheets and some of the specialties. Consumers probably will get no more tonnage than in the current quarter, but shipments will be more in line with promises than at any time in recent months.

Demand is particularly heavy in strip and hot-rolled sheet. Spot openings this quarter for additonal cold-rolled carbon sheet tonnage are readily filled. Indications are that carry-overs into the second quarter will be small on most flat-rolled products.

Wire . . .

Wire Prices, Pages 128 & 129

Some users of screw and heading stock are deferring shipments, while others are specifying heavier tonnage. More makers of upholstery coils are spreading out their carbon wire orders from three to four months.

Chicago district mills are experiencing good order volume for merchant products and are able to accommodate it from balanced inventories. It is noted that farmers are buying little fence. This is a seasonal situation. The high level of demand for manufacturers products is expected to continue for months. Sales of wire rope and construction items are brisk.

Steel Bars . . .

Bar Prices, Page 126

Producers of carbon bars haven't been noticeably affected by cutbacks in automotive orders. They've simply diverted the released tonnage to other consuming account, reducing their carry-overs correspondingly. Even this extra tonnage has not been sufficient to bring supply and demand into balance in the first quarter.

There is less hectic demand for cold-drawn bars than for hot-rolled. But the cold-finishers expect heavy second quarter business. In the East, in fact, demand is reported on the uptrend, and shipments are said to be limited only by the amount of hot bar stock available. The improvement is attributed to a desire of consumers to build inventories.

The better demand for cold drawn is resulting in increased pressure on the hot mills, especially for rounds, ranging from 1 to 4 in.

In New England, some easing in hot-rolled carbon bar demand is noted, also in alloy bars. This is seen in early scheduling of second quarter tonnage, and shows up principally in the smaller sizes, 2-in. and under. Carry-overs will be substantially smaller next quarter, and more tonnage will be available for converters and the warehouses.

Most of the cold-finished bar mills are incorporating the 35 cent extra for special quality in their base prices.

U. S. Steel Export Co., New York, advanced its export price on cold-finished carbon bars from 6.34 to 6.69 cents, with freight included to New York, Philadelphia or Baltimore. The increase became effective Jan. 14 on shipments from producing mills.

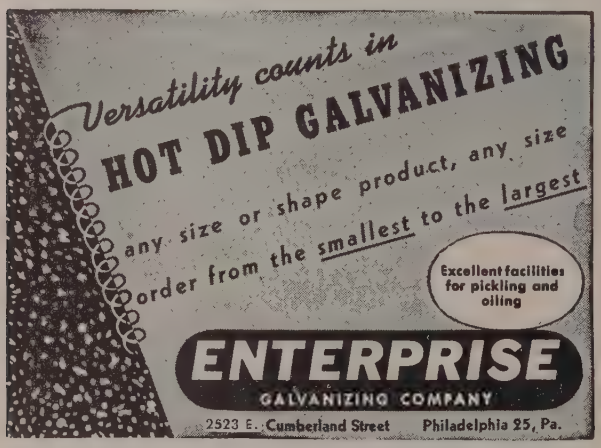
Watertown (Mass.) Arsenal closes bids Feb. 6 on 600 tons of hot-rolled carbon steel bars for remelting.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 126

Reinforcing steel demand is the heaviest in recent years in the New England market. Prices are firmer, with distributors reportedly sold ahead about three months, on the average. Bridge inquiry predominates, but industrial and commercial building, also schools, account for some 3000 tons.

A substantial tonnage of mat rein-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STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

ing for highways (at least 5000) is building up. Piling is sold ugh second quarter. Nearly 10,- tons are actively before the mar- for the Connecticut turnpike.

ew business in the Pacific North- is developing in substantial me, and district rolling mills are red of continued high level op- ions through the quarter. State way projects, Alaskan military allations and private construc- will take large tonnages as the advances.

ainless Steel . . .

Stainless Steel Prices, Page 130

llegheny Ludlum Steel Corp., sburg, following the lead of r producers, has raised its prices cold-finished stainless steel bars wire and stainless hot-rolled wire s. Reason: To bring the products e closely in line with other stain- items and other steel prices. adjustment on wire affects only ducts ½-in. and under.

ates . . .

Plate Prices, Page 126

ressure for plates is undiminished. ne mills are opening their books second quarter orders. Consum- are taking all the tonnage avail- e and clamoring for more. This especially true of railroads and road equipment builders and those ering to the oil, gas and chemical ustries. Rated volume for indi- t defense needs is growing.

tructural fabricators want more tes, and even the shipyards, which ven't been too busy, are stepping up uiries as their operations increase. e yards are scheduled to get more el, but not so much as they want protection against a possible steel ike this summer. The strike ques- n, in fact, is stimulating demands most consumers for all the major el products.

Plate carry-overs may be smaller ien next quarter opens. But it n't be for lack of demand. Rather, will reflect conservative booking new business, blankouts of produc- n to care for the overflow from t quarter and heavier output.

Construction firms trying to bol- r their inventories before the build- g season begins are meeting with tle success.

David F. Austin, executive vice esident, commercial, U. S. Steel rp., says private construction dol- outlays will total about the same last year's, with a higher level of mmercial and industrial construc- n.

A Seattle importer, Roy Martin Jr., s contracts for 10,000 tons of plates from the San Vicente, Chile, plant of Cie de Arco del Pacifico, S.A. The plates are said to be competitive with domestic tonnage out of warehouse.

Tubular Goods . . .

Tubular Goods Prices, Page 130

Tubemakers are beginning 1956 with a burst of shipments. Predictions are being made that this will be another record year in over-all tonnage movement of tubular goods. Customers, particularly in the oil fields, hold low inventories.

First quarter order books for seamless tubes are closed. Despite heavy demand, strong shipments have cut the carry-over of unfilled orders, one Pittsburgh mill reporting all unshipped 1955 orders were in process by mid-January.

Several producers of oil country goods have opened their books for second quarter orders. They are expecting strong sales for the entire year, particularly high-alloy grades.

Cast iron pipe sales agencies in the Pacific Northwest are expecting much new business to come out for bids in February. Unfavorable

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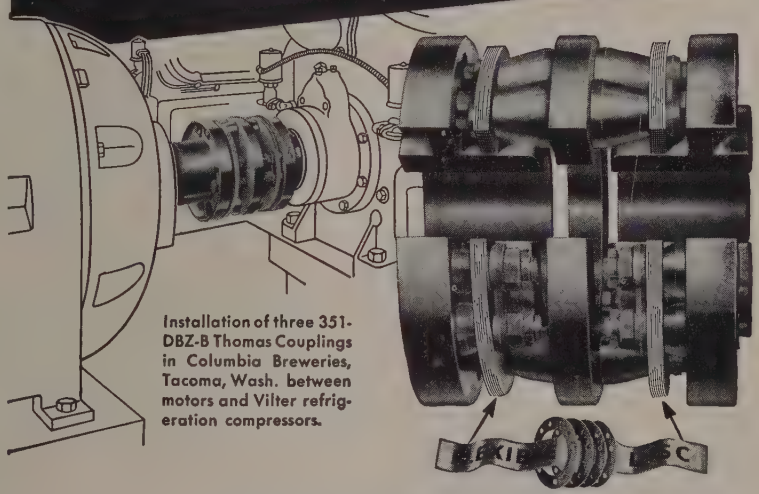
for more years of better service!

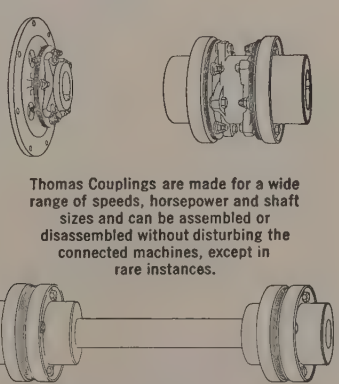


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.

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Indiana Pressed Steel engineers will gladly advise in the redesign of your products to use stampings in place of castings. Indiana Pressed Steel stampings can reduce your costs, save on product weight, assure improved finish, and eliminate machining and finishing costs. Stampings are uniform and dependable.

There is no obligation in asking us to survey your individual problem . . . Phone today, or send us a sample or specifications of one or more parts that you would like to consider changing to stampings. You'll hear from us promptly.

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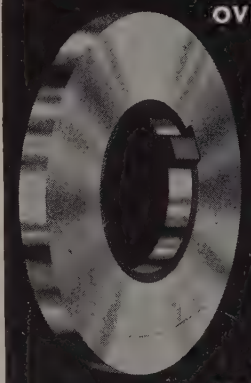

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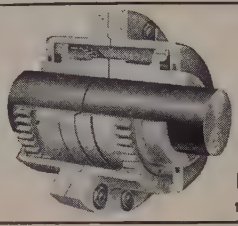

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SOLID STAINLESS

HEAT-RESISTING STAINLESS with exceptional forming qualities

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Whatever your needs for stainless steel sheets and plates, remember that Ingersoll specializes not only in *solid* stainless, but in *heat-resisting* alloys, and *stainless-clad* sheets as well.

So our recommendations are unbiased, and are based on your *needs*. Consult our engineers, without cost or obligation.

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Ingersoll STEEL DIVISION

Borg-Warner Corporation

310 S. Michigan Ave., Chicago 4, Ill.

Plant: New Castle, Ind.

ther in the area has retarded de-
pment of proposed projects in
uary.

onsolidated Western Steel Di-
on, U. S. Steel Corp., has started
ration of a small pipe mill at
eva, Utah. Annual capacity is
)00 tons.

g Iron . . .

Pig Iron Prices, Page 131

Merchant pig iron business contin-
active. Shipments may increase
re next month as consumers an-
pate higher freight rates toward
end of February and the possibil-
of higher base prices on pig iron
rtly thereafter.

Malleable shops in particular are
essing for tonnage. They appear
be trying even harder for malleable
ap, paying several dollars a ton
re for this material than they do
pig iron. They need the scrap,
ich is scarce, to bring down the
rbon content of their melts.

Some Brazilian pig iron is being
ported for consumption at the
irless Works, Fairless Hills, Pa.

The melt in New England holds at
rate about 20 per cent over last
ar's. Supplies are ample despite
extended suspension of operations
the Mystic furnace, Everett, Mass.

ron Ore . . .

Iron Ore Prices, Page 139

Consumption of Lake Superior iron
e in December amounted to 7,663,-
33 gross tons, against 7,488,457 in
ovember, and 6,341,433 in Decem-
er, 1954, reports the Lake Superior
ron Ore Association. Consumption
or all of 1955 was 88,406,680 tons,
ompared with 67,027,594 in 1954.

Stocks of Lake Superior ore on
and at Lake Erie docks and at fur-
aces (including Canadian) totaled
4,359,011 tons on Jan. 1. This com-
ares with 51,040,154 on Dec. 1, and
vith 44,017,825 on Jan. 1, 1955.

Metallurgical Coke . . .

Metalurgical Coke Prices, Page 139

Production of coke in November
6,537,397 net tons) decreased nearly
2 per cent from October's output, re-
orts the Bureau of Mines. Daily av-
erage output in the month, however,
was the highest since December,
1951.

Oven coke accounted for 6,353,233
tons, beehive only 184,164 tons. In
November, 1954, oven coke produc-
tion was 5,207,200 tons, beehive
39,700.

Output of coke in the first 11
months of last year was 68,284,996
tons, of which 66,812,091 were oven
coke and 1,472,905 beehive.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.10
Mesabi nonbessemer	10.95
Open-hearth lump	12.10

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	26.00-28.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$33.75-$34.25
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.06-$1.11 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 95c-$1.00.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $45.00-$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	33.00-35.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.60-$3.85
60-65%	3.85-4.00

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: St. Louis, $150.

Silica Brick (per 1000))

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawstone, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawstone, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $124; Woodbridge, N. J., $122.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Mo., $194; Danville, Ill., $197; Philadelphia, Clearfield, Pa., $201.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $241; Danville, Ill., $244; Philadelphia, Clearfield, Pa., $248.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., Philadelphia, $286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $258.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ½-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅜-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens	
Connellsville, furnace	$13.75-14.50
Connellsville, foundry	16.00-17.00
Oven Foundry Coke	
Birmingham, ovens	$25.65
Cincinnati, deld.	30.58
Buffalo, ovens	27.50
Buffalo, deld.	28.75
Camden, N. J., ovens	26.50
Chicago, ovens	27.00
Cincinnati, deld.	28.50
Detroit, ovens	27.50
Detroit, deld.	28.50
Pontiac, deld.	29.06
Saginaw, deld.	30.58
Erie, Pa., ovens	27.50
Everett, Mass., ovens New England, deld.	*28.55
Indianapolis, ovens	26.75
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	27.50
Neville Island, (Pittsburgh) Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
St. Paul, ovens	26.50
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00
Per ton, bulk, ovens	
Ammonium sulphate	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Fluorspar

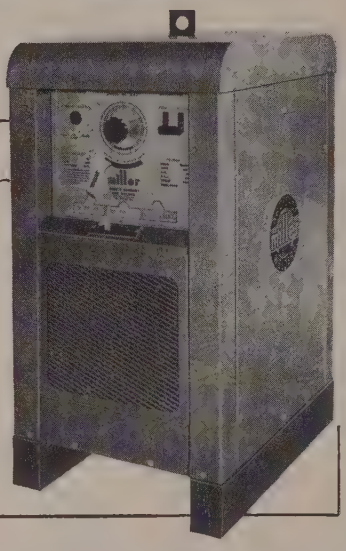
Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

Inches Diam	GRAPHITE Length	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5½	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25
	CARBON	
8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

in *Shipbuilding*
as in other great industries
MILLER WELDERS
are preferred



Miller Selenium Rectifier type D.C. Arc Welders are available in four wide range models. For complete information on these and other Miller arc and spot welders, contact us today at no obligation, of course.

St. Louis Shipbuilding and Steel Co., largest builders of inland towboats in the world, require welds that will withstand a maximum amount of abuse.

Look anywhere in St. Louis Shipbuilding's mammoth yard and you will see Miller Selenium Rectifier type D.C. arc welders — in single units or in batteries of four and five for greater output.

For dependable welds, St. Louis Shipbuilding prefers the Miller S.R. welder. Miller is glad to be aboard.

ARC-SPOT miller GENERATORS WELDERS

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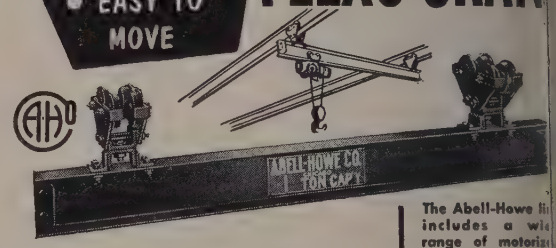
ELECTRIC MANUFACTURING CO., INC.
APPLETON, WISCONSIN

DISTRIBUTED IN CANADA BY

CANADIAN LIQUID AIR CO., LTD., MONTREAL, P.Q.

• NEW
• INEXPENSIVE
• EASY TO MOVE

FLEXO-CRAN



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For Handling of Loads Up to One Ton

If real economy, safety and ease of operation are of interest to you, check into Abell-Howe's new FLEXO-CRANE. You can buy it complete with hoist and other accessories or assemble it yourself from a FLEXO-CRANE "kit".

Bulletin F-110
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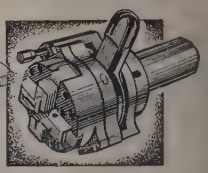
ABELL-HOWE CO. 53 W. JACKSON BLVD. CHICAGO 4, ILLINOIS

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY

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INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS
By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

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69 Illustrations **Price $5.00 Postpaid**

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, 18-21-23% Mn, $94; 19-21% Mn, 1-3% Si, $91.50; 16-19% Mn, $89.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $205. Duquesne, Johnstown, Sheridan, Pa.; Philo, O.; Tacoma, Wash.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $213 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 30.95c per lb of contained Mn, carload packed 32c, ton lots 33.5c, less ton 34.7c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 7.5% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 22.35c per lb of contained Mn, packed, carload 23.4c, ton lot 25c, less ton 26.2c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 30c; 2000 lb to min carload, 32c; 250 lb to 1999 lb, 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.5c per lb of alloy. Packed, c.l. 12.5c, ton 12.95c, less ton 13.95c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 26.25c per lb of contained Cr; c.l. packed 27.5c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02 max 38.50c, 0.03% max 38c, 0.06% max 36.50c, 0.1% max 36c, 0.15% max 35.75c, 0.2% max 35.50c, 0.5% max 35.25c, 1.0% max 34c, 1.5% max 33.85c, 2.0% max 33.75c. Ton lot, add 3.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. 8 M x D, bulk 27.4c per lb contained Cr. Packed, c.l. 28.7c, ton 30.5c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed 8 M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.2% min, Fe 0.2 max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.28. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.75c per lb of contained Si. Packed, c.l. 14.85c, ton lot 16.3c, less ton 17.95c. F.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lots, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed, c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 98% Si, 0.75% max Fe, 0.07 max Ca). C.l. lump, bulk, 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lots packed 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c, per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D. $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb of alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15c, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.5c per lb of briquet, c.l. packed, pallets 12.7c, bags 13.5c; 3000 lb to c.l., pallets 13.9c; 2000 lb to c.l., bags, 14.7c, less ton 15.6c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 13.15c per lb of briquet, c.l. packed, pallets, 13.35c; bags 14.15c, 3000 lb to c.l., pallets, 14.55c; 2000 lb to c.l., bags, 15.35c; less ton 16.25c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 7.15c per lb of briquet; packed, pallets, 7.35c; bags, 8.15c; 3000 lb to c.l., pallets, 8.95c; 2000 lb to c.l. bags 9.75c; less ton 10.65c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.3c. Packed, pallets 7.5c; bags 8.34c; 3000 lb to c.l. pallets 9.1c; 2000 to c.l. bags 9.9c; less ton 10.8c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.33 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.30 per lb of contained W; 2000 lb W to 5000 lb W, $3.40; less than 2000 lb W, $3.52. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, delivered; less ton lots $4.70.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, c.l. packed ½ in. x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 17.50c. Packed c.l. 18.50c, 200 lb to c.l. 19.50c, less than 2000 lb 20c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base; carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.54 in all sizes except powdered which is $1.66; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa.; $1.31 in cans; in bags, $1.30, f.o.b. Langeloth, Pa.; $1.24, Washington, Pa.

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g Iron Output Sets Record

Blast furnaces, operating at 92.7 r cent of capacity, poured a record ,800,831 tons of pig iron and ferro- loys during 1955, says the American on & Steel Institute, New York.

This was 1,943,959 tons more than e previous high of 75,856,872 tons oduced in 1953. Output in 1954 as 58,686,884 tons.

Blast furnace output in December as 6,953,516 tons.

crap . . .

Scrap Prices, Page 144

Pittsburgh—A leading mill buyer ntered the scrap market here for ie first time this year, placing rep- sentative orders for steelmaking ades at prices about $3 per ton nder those recently prevailing. It aid $51 for No. 1 heavy melting eel, $46 for No. 2 heavy melting nd $43 for No. 2 bundles.

Philadelphia — Steel scrap prices re unchanged. Pending the test of ebruary coverage, some traders oubt if there will be much change. onsumption is heavy, but scrap is oming out freely, even though it is less volume than earlier in the onth when the tonnage held back December for tax purposes came ut in especially large quantities.

For the moment, exporters are aiting to see what develops price- ise on the domestic front before aking new offerings. Schumann lan countries have indicated they ould like about 450,000 tons from is country in the current quarter.

Cast prices are strong, particular- malleable.

Boston—Steel scrap prices on ton- age for district consumption are olding. Brokers' buying prices ange up to $48, shipping point, for op grade heavy melting and bushel- ng. There are soft spots in other rades for outdistrict shipment, with onsiderable scrap still to be bought gainst old orders.

With two ships in for loading, ex- ort buying has suffered from an mbargo on dock deliveries. The eason given is need of cars.

Borings and turnings are easier on ight buying.

Buffalo — While mixed undercur- ents prevail in the local scrap mar- et, prices are unchanged. Rumors f lower prices on the steelmaking rades have not been substantiated y sales. Cast grades went up $1 to 2 a ton, cupola now being quoted 48-$49, and No. 1 machinery $52- 53.

New York—Brokers' prices have eveled off, reflecting little change in almost two weeks. Movement of most tonnage is against old orders. What effect February coverage will have on prices remains to be seen, but most sellers anticipate little change. While consumption should continue brisk, scrap is moving freely, particularly for this time of the year. Prices on cast and steel grades reflect steadiness.

Cleveland—Sluggish demand and softer market sentiment generally are reflected in a further downturn in prices on steelmaking grades of scrap in this area and the Valley. Locally, the market on the steel grades is off about $2.50 a ton, with No. 1 quoted at $51.50-$52.50. Auto lists are expected out in the next few days, and bidding on these may indicate the immediate future trend of prices. Auto tonnage is said to be off about 10 per cent from a month ago.

Chicago — The scrap market has turned definitely softer here. Prices of important steelmaking grades are off from $2 to $5 a ton. Limited mill purchases followed a week in which brokers were offering dealers considerably less for favored grades. Affected in the drop are blast furnace and foundry grades as well. For the moment, it appears steelmakers have arrested a runaway market by not buying.

Washington—Consumption and stocks of ferrous materials decreased in November, reports the Bureau of Mines. Scrap stocks (6,466,000 tons) at the end of the month showed a decline of 2 per cent from October, and stocks of pig iron (2,103,000 tons) were off 3 per cent.

Consumption (scrap and pig iron) declined 4 per cent during the month. The figure for scrap was 6,308,000 tons, 2 per cent less than in October. Pig iron consumption was 5,836,000 tons, down 6 per cent. The total melt (12,144,000 tons) consisted of 51.9 per cent scrap and 48.1 per cent pig iron, compared with 51 and 49 per cent in October.

Cincinnati—A slight price weakness in scrap (in sympathy with decreases in other areas) is spreading here. No new buying is noted, and brokers are adopting a "wait-and-see" attitude. Foundries are operating at high level, providing support to current cast scrap prices. Steelworks grades are off about $1 a ton.

Detroit—Scrap prices are firm here despite production cutbacks in the automotive industry. Dealers say the market is still soft, but they are waiting for auto lists to come out before making price revisions. District ingot operations are around 100 per cent of capacity.

St. Louis—Railroad scrap prices took a tumble last week—as much as $5 a ton on No. 1 railroad heavy melting and random length rails. The drop is expected to be reflected to some extent in other grades, perhaps by $1 or so a ton.

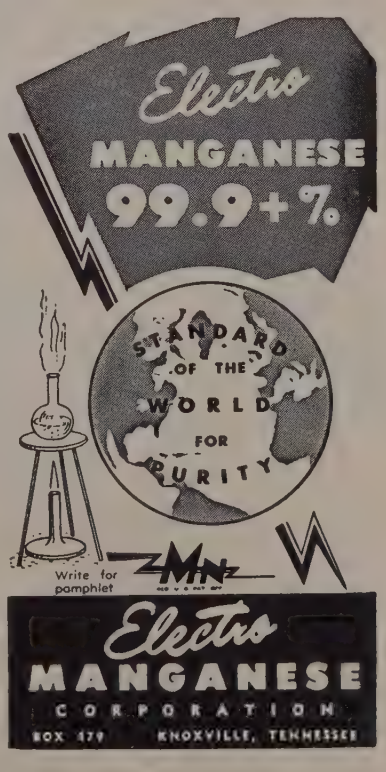
The mills and foundries are loaded with scrap. One small mill here has limited shipments, but the two major producers continue to take in metal as it comes.

Birmingham—With dealers filling orders for open-hearth scrap placed in December, and no new buying of this grade noted, brokers report the market is softer. They say there is little likelihood of any further price increases in the immediate future. More scrap is coming into the yards. Electric furnace and cast iron grades are moving actively at unchanged prices.

Los Angeles—Scrap prices continue to rise despite earlier predictions by dealers that year-end adjustments would stabilize the market. No. 1 heavy melting is up $3 to $42; No. 2 heavy melting is up $2 to $39. No. 1 bundles climbed from $39 to $41; machine shop turnings went up $2 to $20.

San Francisco—There's a feeling in the market that steel scrap prices

(*Please turn to page* 146)



Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 25	$51.50
Jan. 18	53.33
Dec. Avg.	50.37
Jan. 1955	34.95
Jan. 1951	46.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*50.00-51.00*
No. 2 heavy melting	*45.00-46.00*
No. 1 bundles	*50.00-51.00*
No. 2 bundles	*42.00-43.00*
No. 1 busheling	*50.00-51.00*
Machine shop turnings	36.00-37.00
Mixed borings, turnings	36.00-37.00
Short shovel turnings	39.00-40.00
Cast iron borings	39.00-40.00
Cut structurals, 3 ft lengths	59.00-60.00
Heavy turnings	46.00-47.00
Punchings & plate scrap	59.00-60.00
Electric furnace bundles	54.00-55.00

Cast Iron Grades

No. 1 cupola	48.00-49.00
Charging box cast	45.00-46.00
Heavy breakable cast	45.00-46.00
Unstripped motor blocks	32.00-33.00
No. 1 machinery cast	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	59.00-60.00
Rails, 2 ft and under	68.00-69.00
Rails, 18 in. and under	69.00-70.00
Rails, random lengths	64.00-65.00
Railroad specialties	63.00-64.00

Stainless Steel Scrap

18-8 bundles & solids	340.00-355.00
18-8 turnings	*235.00-245.00*
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	*51.50-52.50*
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*51.50-52.00*
No. 2 bundles	*41.00-42.00*
No. 2 busheling	*51.50-52.50*
Machine shop turning	30.00-31.00
Mixed borings, turnings	34.50-35.50
Short shovel turnings	34.50-35.50
Cast iron borings	34.50-35.50
Low phos.	55.00-56.00
Cut structural plates 2 ft and under	61.00-62.00
Alloy free, short shovel turnings	37.00-38.00
Electric furnace bundles	*52.50-53.50*

Cast Iron Grades

No. 1 cupola	56.00-57.00
Charging box cast	48.00-49.00
Stove plate	54.00-55.00
Heavy breakable cast	47.00-48.00
Unstripped motor blocks	*37.00-38.00*
Brake shoes	43.00-44.00
Clean auto cast	*54.00-55.00*
Burnt cast	43.00-44.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	71.00-72.00
Rails, 18 in. and under	72.00-73.00
Rails, random lengths	65.00-66.00
Cast steel	60.00-61.00
Railroad specialties	60.00-61.00
Uncut tires	60.00-61.00
Angles, splice bars	66.00-67.00
Rails, rerolling	71.00-72.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	340.00-350.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	105.00-115.00
430 turnings	55.00-65.00

YOUNGSTOWN

No. 1 heavy melting	*54.00-55.00*
No. 2 heavy melting	*46.00-47.00*
No. 1 bundles	*54.00-55.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	57.00-58.00
Machine shop turnings	32.50-33.50
Short shovel turnings	36.50-37.50
Cast iron borings	36.50-37.50
Low phos.	*55.00-56.00*
Electric furnace bundles	*55.00-56.00*

Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00

CHICAGO

No. 1 heavy melting	*48.00-50.00*
No. 2 heavy melting	*38.00-39.00*
No. 1 dealer bundles	*47.00-48.00*
No. 1 factory bundles	*50.00-51.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*48.00-50.00*
Machine shop turnings	*29.00-30.00*
Mixed borings, turnings	*31.00-32.00*
Short shovel turnings	*31.00-32.00*
Cast iron borings	*31.00-32.00*
Cut structurals, 3 ft	*55.00-56.00*
Punchings & plate scrap	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*40.00-41.00*
Unstripped motor blocks	*38.00-39.00*
Clean auto cast	*54.00-55.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt	*51.00-52.00*
R.R. malleable	*62.00-63.00*
Rails, 2 ft and under	*67.00-68.00*
Rails, 18 in. and under	*68.00-69.00*
Angles, splice bars	*65.00-66.00*
Rails, rerolling	*67.00-68.00*

Stainless Steel Scrap

18-8 bundles & solids	335.00-350.00
18-8 turnings	240.00-250.00
430 bundles & solids	110.00-115.00
430 turnings	50.00-55.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	49.00
No. 2 heavy melting	36.00
No. 1 bundles	49.00
No. 2 bundles	36.00
No. 1 busheling	49.00
Machine shop turnings	23.00
Mixed borings, turnings	23.00
Short shovel turnings	27.00
Punchings & plate scrap	55.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	37.00
Stove plate	37.00
Heavy breakable	35.00
Unstripped motor blocks	25.00
Clean auto cast	46.00
Malleable	42.00

BIRMINGHAM

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	42.00-43.00
No. 1 bundles	45.00-46.00
No. 2 bundles	34.00-35.00
No. 1 busheling	45.00-46.00
Cast iron borings	19.00-20.00
Short shovel turnings	30.00-31.00
Machine shop turnings	29.00-30.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate	54.00-55.00
Structural & plate, 2 ft	54.00-55.00
Unstripped motor blocks	39.00-40.00
Charging box cast	32.00-33.00
No. 1 wheel	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
Rails, 18-in. and under	64.00-65.00
Rails, rerolling	64.00-65.00
Rails, random lengths	59.00-60.00
Angles, splice bars	61.00-62.00

PHILADELPHIA

No. 1 heavy melting	55.00
No. 2 heavy melting	49.00
No. 1 bundles	55.00
No. 2 bundles	46.00
No. 1 busheling	55.00
Electric furnace bundles	56.00
Machine shop turnings	38.00
Mixed borings, turnings	38.00
Short shovel turnings	40.50
Heavy turnings	51.00
Structurals & plate	58.00-60.00
Couplers, springs, wheels	61.00
Rail crops, 2 ft & under	67.00

Cast Iron Grades

No. 1 cupola	52.00-53.00
Malleable	68.00
Heavy breakable cast	54.00
Drop broken machinery	57.00-58.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	46.00-47.00
No. 1 bundles	49.00-50.00
No. 2 bundles	40.00-42.00
Machine shop turnings	29.00-30.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	32.00-33.00
Low phos. (structural & plate)	50.00-52.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Unstripped motor blocks	32.00-33.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips solids	320.00-325.00
18-8 borings, turnings	150.00-160.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*46.00-46.50*
No. 2 heavy melting	*39.50-40.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*37.50-38.00*
Machine shop turnings	*26.50-27.00*
Mixed borings, turnings	*28.00-28.50*
Short shovel turnings	*29.50-30.00*
No. 1 cast	*47.00-47.50*
Mixed cupola cast	*44.00-44.50*
No. 1 machinery cast	*49.00-49.50*

BUFFALO

No. 1 heavy melting	47.00-48.00
No. 2 heavy melting	43.00-44.00
No. 1 bundles	47.00-48.00
No. 2 bundles	40.00-41.00
No. 1 busheling	47.00-48.00
Mixed borings, turnings	33.00-34.00
Machine shop turnings	31.00-32.00
Short shovel turnings	35.00-36.00
Cast iron borings	35.00-36.00
Low phos.	49.00-50.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*48.00-49.00*
No. 1 machinery	*52.00-53.00*

Railroad Scrap

Rails, random lengths	58.00-59.00
Rails, 3 ft and under	60.00-61.00
Railroad specialties	51.00-52.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*46.00-47.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 bundles	*46.00-47.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*46.00-47.00*
Machine shop turnings	30.50-31.50
Mixed borings, turnings	30.00-31.00
Short shovel turnings	31.50-32.00
Cast iron borings	30.00-31.00
Low phos., 18 in.	56.00-57.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	44.00-45.00
Charging box cast	44.00-45.00
Drop broken machinery	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt	*54.00-55.00*
Rails, 18 in. and under	67.00-68.00
Rails, random lengths	60.00-61.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	40
No. 2 heavy melting	38
No. 1 bundles	40
No. 2 bundles	34
No. 1 busheling	40
Machine shop turnings	28
Short shovel turnings	28

Cast Iron Grades

No. 1 cupola	47
Charging box cast	41
Heavy breakable cast	39
Unstripped motor blocks	39
Brake shoes	43
Clean auto cast	48
Stove plate	41

Railroad Scrap

No. 1 R.R. heavy melt	50
Rails, 18 in. and under	66
Rails, random lengths	60
Rails, rerolling	68
Angles, splice bars	58

SEATTLE

No. 1 heavy melting	48
No. 2 heavy melting	44
No. 1 bundles	40
No. 2 bundles	38
No. 3 bundles	25
Machine shop turnings	15.00-16
Mixed borings, turnings	15.00-16
Short shovel turnings	15.00-16
Electric furnace, No. 1	55

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	50
Heavy breakable cast	40
No. 1 wheels	35
Unstripped motor blocks	33
Clean motor blocks	40
Stove plate (f.o.b. plant)	35
Brake shoes	35

Railroad Scrap

Rails, random lengths	33

LOS ANGELES

No. 1 heavy melting	42
No. 2 heavy melting	38
No. 1 bundles	41
No. 2 bundles	33
Machine shop turnings	20

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	48

SAN FRANCISCO

No. 1 heavy melting	44
No. 2 heavy melting	42
No. 1 bundles	44
No. 2 bundles	38
No. 1 busheling	44
Machine shop turnings	23
Mixed borings, turnings	23
Cast iron borings	23
Short shovel turnings	25
Cut structurals	40
Heavy turnings	25
Punchings & plate scrap	44

Cast Iron Grades

No. 1 cupola	50
Charging box cast	35
Stove plate	39
Heavy breakable cast	36
Unstripped motor blocks	32
Brake shoes	35
Clean auto cast	50
No. 1 wheels	39
Burnt cast	23
Drop broken machinery	50

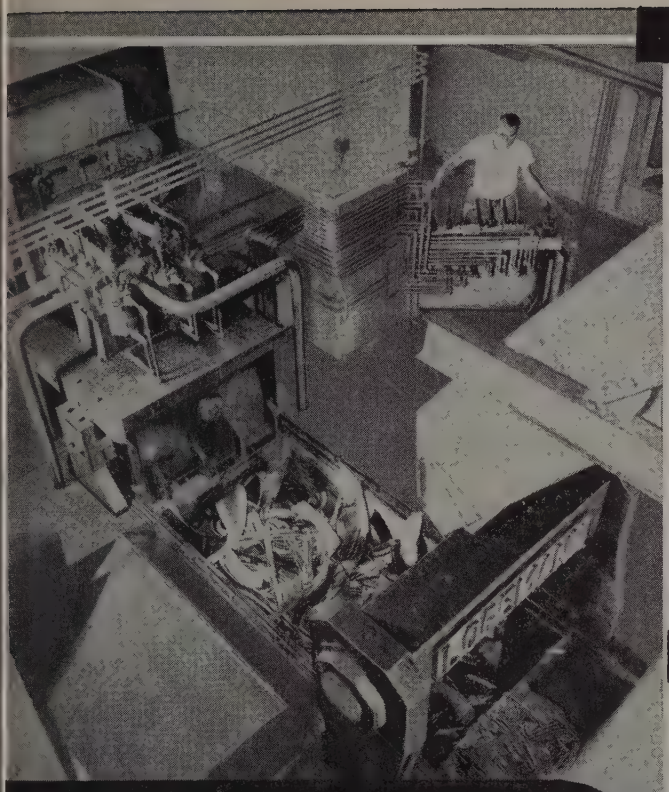
HAMILTON, ONT.

No. 1 heavy melting	45
No. 2 heavy melting	41
No. 1 bundles	45
No. 2 bundles	38
Mixed steel scrap	38
Mixed borings, turnings	19
Rails, remelting	54
Busheling, new factory: Prepared	43
Unprepared	39
Short steel turnings	27

Cast Iron Grades†

No. 1 machinery cast	42.00-45

†F.o.b., shipping point.



LOGEMANN Metal Balers

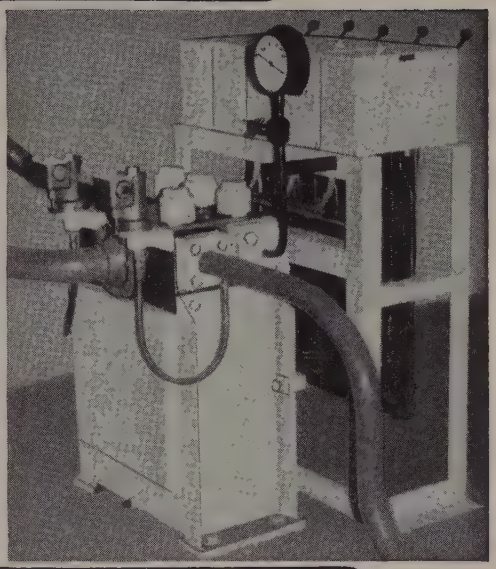
. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

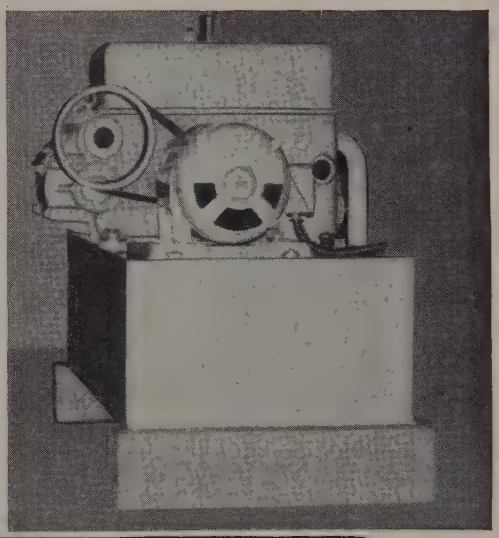
LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.

LOGEMANN



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

LOGEMANN BROTHERS CO.

1126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

(*Concluded from page* 143)

will be marked down before too long. Reasons: Record high prices have stimulated shipments, and there has been some slackening in exports.

Seattle—The scrap market is weaker. Dealers anticipate a drop of $2 to $3 a ton in prices when January contracts expire. Prices are unchanged, with No. 1 heavy melting at $48, and No. 2 at $44. Export interests are receiving fewer inquiries. Receipts continue heavy.

Warehouse . . .

Warehouse Prices, Page 131

Distributors are advancing base prices on alloy bars to compensate for the adjustment in mill analysis extras. In the Philadelphia district, type 4140, annealed, for instance, is higher at 13.21 cents, warehouse, in lots of 1000 to 1999 lb, against 13.16 cents previously. Warehouse size extras are being changed in line with mill revisions of these extras.

There have been upward revisions in galvanized sheet prices to reflect the recent increase in zinc prices. In many districts, cold-finished bar prices have been raised to cover higher handling and other costs.

Further price advances are expected to be posted if freight rates are raised Feb. 25.

Warehousemen have no sales worries. Demand began to mount early this month and is still strong. Supplies are becoming more unbalanced. Plate, bars and structural shapes are the most difficult products to keep in balance.

In the Pittsburgh district, there's not much demand for sheet. There are only a few regular warehouse customers for this product in the area, and most of the emergency demand from mill customers has dropped off. Construction firms continue to pay warehouse prices for plate and structural shapes, although some formerly purchased from mills directly.

Distributors in the St. Louis district claim they have more than enough orders to counteract any slack developing in purchases by the automotive industry. They fear a "snowball" effect from the auto slowdown.

Cold Metal Products Co. of California has added bars to its stocks of stainless sheets, strip and plates at its Los Angeles warehouse. It also stocks a wide variety of other flat-rolled products, including cold-rolled low-carbon, spring, stainless and zinc-coated strip, tin and zinc-coated steel and flat wire.

Rails, Cars . . .

Track Material Prices, Page 129

Domestic freight car orders totaled 169,872 in 1955, against 23,324 in 1954, reports the American Railway Car Institute and the Association of American Railroads.

December orders amounted to 42,278 cars, compared with the record 51,066 placed in November. The month's total was the second highest awarded since the railroads started their buying splurge last June. In December, 1954, only 2885 were ordered.

Carbuilders' backlogs rose to 147,320 as of Jan. 1, compared with 109,370 on Dec. 1, and 15,137 on Jan. 1, 1955.

Freight car deliveries in December went up slightly to 3796, against 3427 the preceding month. In December, 1954, deliveries totaled 2173. Deliveries for all of 1955 were 36,896, compared with 35,558 the preceding year.

Structural Shapes . . .

Structural Shape Prices, Page 126

Extended deliveries on large fabricated structural tonnages, running ten months to a year, are resulting in the channeling of more new jobs to marginal shops. Without established buying patterns for obtaining larger tonnages of structurals on mill quotas, the question arises: Where will these marginal shops get steel? One eastern welding shop in this category recently closed on a 10,000-ton job.

The two lowest bidders for the 11,000-ton, 23-span stringer bridge at Bridgeport, Conn., beat out larger fabricators on direct bids for the superstructure.

High demand for heavy structural sections is expected to more than balance the slight improvement in supply expected when new facilities in the East come in late in the second quarter. Included is a large tonnage for electric power plant expansion.

Construction companies are trying to bolster their stocks by buying from warehouses, but warehouse supplies are reported nearly exhausted. Expectations are that supplies of wide flange beams will be tight throughout the 1956 construction season. In general, the mills are one month to six weeks behind on deliveries of structurals.

Although structural awards are spotty, an increasing volume of tonnage is reported being figured.

Contract for the steel framework on the world's largest rivetless skyscraper has been awarded to Bethlehem Steel Co., Bethlehem, Pa., the Tishman Realty & Construct Co. Inc. The 13,000 tons of st used will be fastened with spec high-carbon steel bolts of great te sile strength. They will be held place by a nut and washer tighten with an impact wrench. The 38-sto structure will be erected at 666 Fi Ave., New York.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

8000 tons, Ft. Pitt bridge superstructure, state project, Pittsburgh, to Ameri Bridge Division, U. S. Steel Corp., Pi burgh.

7100 tons, ½-mile viaduct and ten gr separation structures, Connecticut turnpi Greenwich-Stamford, to J-K Welding (Klevens Corp., Yonkers, N. Y.); Poi & McLane Corp., New York, general c tractor.

6000 tons, office and plant, *Chicago Sun-Tim* Chicago, for Field Enterprises Inc., Bethlehem Steel Co., Bethlehem, Pa.

4850 tons, unit to power station, Waukeg Ill., for Commonwealth Edison Co. Bethlehem Steel Co., Bethlehem, Pa.

4500 tons, criminal court building, Kew G dens, Long Island, N. Y., to Schacht S Construction Inc., New York.

4000 tons, bridges, Massachusetts turnpi Weston, Mass., to American Bridge Divisi U. S. Steel Corp., Pittsburgh, through Perini & Sons Inc., Framingham, Ma general contractor.

4000 tons, medical and surgical building, st hospital, Creedmoor, Long Island, N. to Schacht Steel Construction Inc., N York, through the Depot Construction Co

3000 tons, department store, Denver, thro Webb & Knapp Construction Co., New Yo to Bethlehem Steel Co., Bethlehem, Pa.

2100 tons, plant addition, Pratt-Whitney A craft Division, United Aircraft Corp., No Haven, Conn., to Harris Structural S Co., New York; Turner Construction New York, general contractor.

1600 tons, Hartford Research Center, Midd town, Conn., to Grand Iron Works, N York; bids direct to the Corps of En neers, Boston.

1500 tons, structurals and bars, papermak felt plant, F. C. Huyck & Sons, Alicevi Ala., to American Bridge Division, U. Steel Corp., Pittsburgh; Daniel Construct Co., Birmingham, general contractor; re forcing bars to Ceco Steel Products Co Birmingham.

1400 tons, factory and office, for Rex P Corp., Skokie, Ill. to Bethlehem Steel Co Bethlehem, Pa.

1300 tons, Bell Laboratory, Murray Hill, N. to the Bethlehem Steel Co., Bethlehem, P

1300 tons, office building, Columbus, through Ebasco Services to C. E. Morris Columbus.

1295 tons, five grade separation structu Connecticut turnpike, Milford, Project 3 02, to Phoenix Bridge Co., Phoenixville, P Lizza & Sons Inc., Oyster Bay, N. general contractor.

1040 tons, transmission towers, American & Electric Corp., New Carlisle, Ind., American Bridge Division, U. S. Steel Co Pittsburgh.

945 tons, six grade separation structu Connecticut turnpike, Milford-Orange, P ect 315-01, to Bethlehem Steel Co., Beth hem, Pa.; Lizza & Sons Inc., Oyster B N. Y., general contractor.

700 tons, office, Nestle Co., White Plai N. Y., to Dreier Structural Steel Co. I Long Island City, N. Y.

685 tons, five grade separation structu Connecticut turnpike, Orange-West Hav Project 315-02, to Phoenix Bridge Phoenixville, Pa.; John Arborio Inc., Pou keepsie, N. Y., general contractor.

600 tons, manufacturing building, Johns-M ville Corp., Marrero, La., to Ameri Bridge Division, U. S. Steel Corp., Pi burgh.

600 tons, state highway bridge, Chatau county, New York, through Yonkers C

CLASSIFIED

Positions Wanted

SHOP SUPERINTENDENT

35. Fifteen years' experience miscellaneous structural steel fabrication, some ornatal. With a full knowledge shop practices; ity to handle planning and supervision. owledge of welding procedures and codes. west vicinity. Reply Box 364, STEEL, Pen- Bldg., Cleveland 13, Ohio.

DROP FORGE SUPERINTENDENT

years' experience in all phases of forging rations. Boards to 7500 Stearns to 15,000 letters to 7½ inch. Capable of managing ll plant. Reply Box 366, STEEL, Penton g., Cleveland 13, Ohio.

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racting Co. to the Pine Brook Iron Works, cranton, Pa.

tons, plant building, Kollsman Co., Syosset, N. Y., through the Kretter Construction o. to the Calvert Iron Works Inc., Atlanta, a.:

tons, state bridge work, Queens, New York, hrough the Slattery Foundation Co., to n unnamed fabricator.

tons, Oregon state overpass, Klamath alls, to Poole, McGonigle & Dick, Portand, Oreg.; Tom Lillebo, Reedsport, Oreg., eneral contractor at $899,964.

tons, three-span WF beam bridge, Ferrisburg, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Earle & Merry Inc., Rutland, Vt., general contractor; 50 tons, reinforcing bars, to Truscon Steel Division, Republic Steel Corp., Boston.

0 tons, state bridge work, Putnam county, New York, through G. E. Camarco, general contractor, to the Pine Brook Iron Works, Scranton, Pa.

0 tons, three state bridges, Stockbridge, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; John F. Fitzgerald Construction Co., Boston, general contractor; 80 tons, reinforcing bars, to Joseph T. Ryerson & Son Inc., Boston.

STRUCTURAL STEEL PENDING

..000 tons, bridge superstructure, 23 stringer spans, Connecticut turnpike, Bridgeport harbor, Project 311-02; Terry Contracting Co. Inc., New York, low; also 1440 tons of reinforcing bars.

490 tons, ten grade separation structures, Connecticut turnpike, Stamford, Project 304-02; bids Feb. 6, Hartford, Conn.

000 tons, east approach and Hawthorne Ave. approach, Morrison street bridge, Portland, Oreg., including angle bracing and other steel; bids Feb. 1.

600 tons, five state bridges, Revere, Mass., contract 5; bids Jan. 31, Boston.

480 tons, four grade separation structures and two ramps, Connecticut turnpike, Bridgeport, Project 311-03; bids Feb. 6, Hartford, Conn.

395 tons, ten grade separation structures, Connecticut turnpike, Fairfield, Project 309-02; bids Feb. 6, Hartford, Conn.

40 tons, four state bridges, Revere, Mass., contract 4; bids Feb. 7, Boston.

75 tons, Episcopal hospital, Philadelphia; bids asked.

295 tons, three state bridges, Route 3 relocation, Plymouth-Bourne, Mass.; bids Jan. 31, Boston.

REINFORCING BARS . . .

REINFORCING BARS PLACED

370 tons, state bridges and highway section, Connecticut turnpike, Milford-Orange, Project 315-01, to Bethlehem Steel Co., Bethlehem, Pa.; Lizza & Sons Inc., Oyster Bay, N. Y., general contractor.

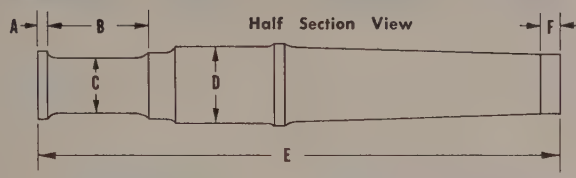
550 tons, store addition, Jorden Marsh Co., Boston, to Concrete Steel Co., Boston; Vappi Construction Co., Cambridge, Mass., general contractor.

600 tons, plant addition, Pratt-Whitney Aircraft Division, United Aircraft Corp., North Haven, Conn., to Concrete Steel Co., New York; Turner Construction Co., New York, general contractor.

540 tons, state highway bridges and highway

FOR SALE

SCRAP STEEL FREIGHT CAR AXLES



A	3/16"
B	11 11/16"
C	5 1/2"
D	7 3/8"
E	7'-6 3/4"
F	6 5/16"

Also Other Sizes of Various Railroad Scrap Axles.

All of these axles are suitable for rerolling into various items, such as: Reinforcing Bars, Flats, Angles, Miscellaneous Shapes, Tie Plates, Angle Bars, et cetera.

IRON & STEEL PRODUCTS, INC.
13462 S. Brainard Avenue
Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

REPUTABLE WELL ESTABLISHED WHOLESALE DISTRIBUTORS STEEL AND HARDWARE, ALSO STEEL FABRICATORS, IN NORFOLK, VA., SEEK GENERAL MANAGER. GOOD SALARY AND FUTURE. WRITE BOX 361, STEEL, PENTON BUILDING, CLEVELAND 13, OHIO.

REPUTABLE WELL ESTABLISHED STEEL JOBBERS IN PHILADELPHIA, PA. SEEK GENERAL MANAGER. GOOD SALARY AND FUTURE. OUR EMPLOYEES KNOW OF THIS AD. WRITE BOX 362, STEEL, PENTON BUILDING, CLEVELAND 13, OHIO.

PLANT ENGINEER WANTED
EXCELLENT OPPORTUNITY FOR MAN OF DEMONSTRATED ABILITY WHO HAS HAD EXPERIENCE IN ROLLING MILL OPERATION EITHER FERROUS OR NONFERROUS. REPLY IN CONFIDENCE TO
BOX 365, STEEL
PENTON BLDG. CLEVELAND 13, OHIO

CLASSIFIED

Help Wanted

GENERAL FOREMAN to take complete charge Job Galvanizing shop in Delaware Valley Area. Must have hot-dip galvanizing experience and at least five years' supervisory experience. Good opportunity for right man. Send resume to Box 363, STEEL, Penton Bldg., Cleveland 13, Ohio.

PRODUCTION SUPERINTENDENT

Leading tool steel manufacturer seeks Production Superintendent experienced in maintenance or production in Merchant Rolling Mills. Minimum of three to five year experience and a mechanical or metallurgical education desired. Complete employee benefits and excellent advancement opportunities. Send full resume to Box 367, STEEL, Penton Bldg., Cleveland 13, Ohio.

SUPERINTENDENT OF BILLET CONDITIONING

Leading tool steel manufacturer seeks superintendent of billet conditioning with several years experience on work involving conditioning of billets. Must be able to develop better grinding techniques and be capable of handling personnel in a department of approximately 150 people. Complete employee benefits and excellent advancement opportunities. Send full resume to Box 368, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR SALE
Furnaces & Plating Equipment
Complete—Like New
Immediate Delivery.

G.E. ROLLER HEARTH 465 KW, 1650 deg. F, 5' wide, 18" high, 20' long & 40' cooling.

G.E. ROLLER HEARTH gas fired, rad. tube. 5' wide, 18" high, 18' long & 40' cooling.

G.E. PUSHER 240 KW, 1650 deg. F, 4' wide, 12" high, 22' long, quench conveyor.

4000 CFH. EXO GEN. w/each above furn.

YOUNG BROS. GAS RECIRC. CONV. BELT, 1000 deg. F, 6' wide, 24" high, 45' lg. NEW.

500 C.F.H. Westinghouse Endothermic Gen.

SURF. COMB. GAS BOX, 30" wide, 18" high, 36" long, 1800 deg. F.

SURF. COMB. GAS BOX, 4' 6" wide, 12' long, 30" high, 1850 deg. F.

2.000 ft. Mechanical Handling System No. 458 Chain with trolley & clevice assemblies.

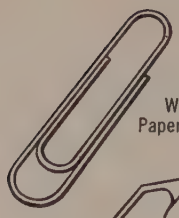
PAPESCH & KOLSTAD, INC.
10707 Capital Avenue
Oak Park (Detroit 37), Michigan
Phone: Lincoln 7-6400

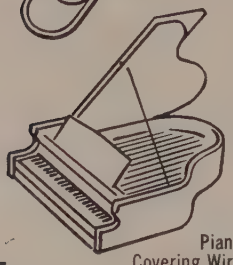
FOR SALE
¾" Steel Channels
75 T—¾" x 9/32" x 5/64" by 20'.
Immediate shipment from New Orleans
BERSHAD INTERNATIONAL CORP.
30 Church St. New York 7, N. Y.
Telephone—Cortland 7-5393

STEEL FOR SALE
Wide plates. Alloy and Carbon steel bars in Hot and Cold rolled grade. Galv. and Black pipe. Send for list.
ROCKWELL ENGINEERING CO.
BLUE ISLAND, ILLINOIS

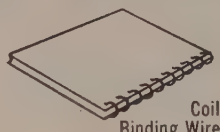
PRESS BRAKE
Two-year old, excellent condition, 300-ton Pacific Hydraulic Press Brake with 16 ft. die bed, 14 ft. 2 in. between housing. Capacity 5/16 in. x 16 ft. or ⅜ in. x 12 ft. on 3 in. Vee die opening. Contact Mr. Garfinkel, STAINLESS WELDED PRODUCTS, INC., CLIFTON, NEW JERSEY, PRescott 8-3000.

WANTED
1—PAYOFF REEL, WITH DRAG BRAKE OR EQUIVALENT, MANUAL OR POWER, FOR 16" I.D. COILS, 36" O.D. MAXIMUM, 1200 LB. MAXIMUM COIL SIZE.
ATHENIA STEEL DIVISION
National Standard Co.
Clifton, New Jersey

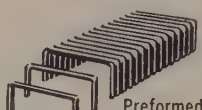

Wire for Paper Clips


Piano Covering Wire

Whatever your problem is in **Wire...**


Coil Binding Wire

Thousands of wire applications in over a half century—involving virtually every kind of a wire problem—that's the experience and background we offer you in solving *your* special wire problems. We can supply wire from almost the size of a human hair, through 9/16" diameter for metal fasteners . . . round wire or wire in special shapes, practically any size, temper, finish and analysis in low carbon and medium low carbon steels. We may have a valuable case history that parallels your own special problem. Fill out and return the coupon for full details of Continental's Wire Service. We are eager to work with you.


Preformed Staple Wire

Wire for Milk Bottle Carriers

Florist Wire

Wire Bales for Buckets, Pails, etc.

Wire for Toy Wheels

Standard and Special Wire Shapes

Fill out and mail today

Gentlemen: Please give us without obligation complete details of your special wire service.

NAME_____ TITLE_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

CONTINENTAL

STEEL CORPORATION · KOKOMO, INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

section, Connecticut turnpike, Milford, Pr ect 314-02, to Bethlehem Steel Co., Bethleh Pa.; Lizza & Sons Inc., Oyster Bay, N. general contractor; 555 tons, steel pi to Bethlehem Steel Co., Bethlehem, Pa.;

280 tons, plant building, High Voltage En neering Co., Burlington, Mass., to Jos T. Ryerson & Son Inc., Boston; Aberth Construction Co., Boston, general contract

265 tons, warehouse, Westwood, Mass., Concrete Steel Co.; G. B. H. Macomber C Boston, general contractor.

210 tons, three underpasses, Boeing Airpl Co., Seattle, to Bethlehem Pacific Co Steel Corp., Seattle; Howard S. Wright Inc., Seattle, general contractor at $353,0

165 tons, refinery-tank footings, Standard Co., Bayway, N. J., to Concrete Steel C New York.

152 tons, storage facilities, Galena, Alas base, to Bethlehem Pacific Coast Steel Cor Seattle; Peter Kiewit Sons Co., Seattle, g eral contractor.

135 tons, school, Haverhill, Mass., to Concr Steel Co., Boston; Sawyer Associates, Bost general contractor.

REINFORCING BARS PENDING

2675 tons, state bridges and highway sectio Connecticut turnpike, Stamford, Project 30 02; bids Feb. 6, Hartford, Conn.; also 39 tons, steel piles, and 265 tons, reinforci mat.

2105 tons, 12 grade separation structure Connecticut turnpike, East Haven-Branfor Project 319-03; M. A. Gammino Constru tion Co., Providence, R. I., low on gene contract; also 1335 tons, reinforcing bar 890 tons, steel piles; and 500 tons, m reinforcing.

1850 tons, 11 grade separation structure Connecticut turnpike, Branford-Guilfor Project 320-01; Union Building & Constru tion Co. Inc., Passaic, N. J., low on gener contract; also, 800 tons of reinforcing ba and 315 tons of steel piles.

1700 tons, state bridge work, Schuylkill e pressway, Philadelphia; bids closed Jan. 2 also, 2450 tons of shapes, noted as pendi in previous issue.

1025 tons, state bridges and highway sectio Connecticut turnpike, Fairfield, Project 30 02; bids Feb. 6, Hartford, Conn.; also, 5 tons, steel piles, and 385 tons, reinforci mat.

975 tons, state bridges and highway sectio Connecticut turnpike, Bridgeport, Proje 311-03; bids Feb. 6, Hartford, Conn.; al 1110 tons, steel piles.

800 tons, substructure, Quinnipiac river bridg Connecticut turnpike, New Haven, Proje 317-02; bids Jan. 30, Hartford; also 9 tons, steel piles.

700 tons, five state bridges, Revere, Mass contract No. 5; bids Jan. 31, Boston.

300 tons, Washington state highway projec Thurston county; general contract to Joh E. Alexander, Seattle, low at $272,317.

265 tons, three state bridges, relocation Rou 3, Plymouth-Bourne, Mass.; bids Jan. 3 Boston.

250 tons, four state bridges, Revere, Mass contract No. 4; bids Feb. 7, Boston.

166 tons, Washington state highway span Spokane county; general contract to Charle A. Power, Spokane, low at $156,331.

160 tons, warehouse and packaging cente Sick's brewery, Seattle; general contrac to John H. Sellen Construction Co., Seattle low at $458,633.

PLATES . . .

PLATES PLACED

2100 tons, straight web sheet piling, Ice Har bor cofferdam project, to Columbia Genev Steel Division, U. S. Steel Corp., Provo Utah, by U. S. Engineer, Walla Walla Wash.

PLATES PENDING

9000 tons, proposed Rocky Reach power proj ect, Columbia river, Wenatchee, Wash.; bid in to Stone & Webster, prime contractor.

900 tons, additional piling required for Ic Harbor project, Snake river; bids to b called by U. S. Engineer, Walla Walla Wash.

240 tons, hull, medium high tensile, black bids Jan. 31, General Stores Supply Of fice, Navy, Philadelphia, East Yards.

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Coming

Feb. 13

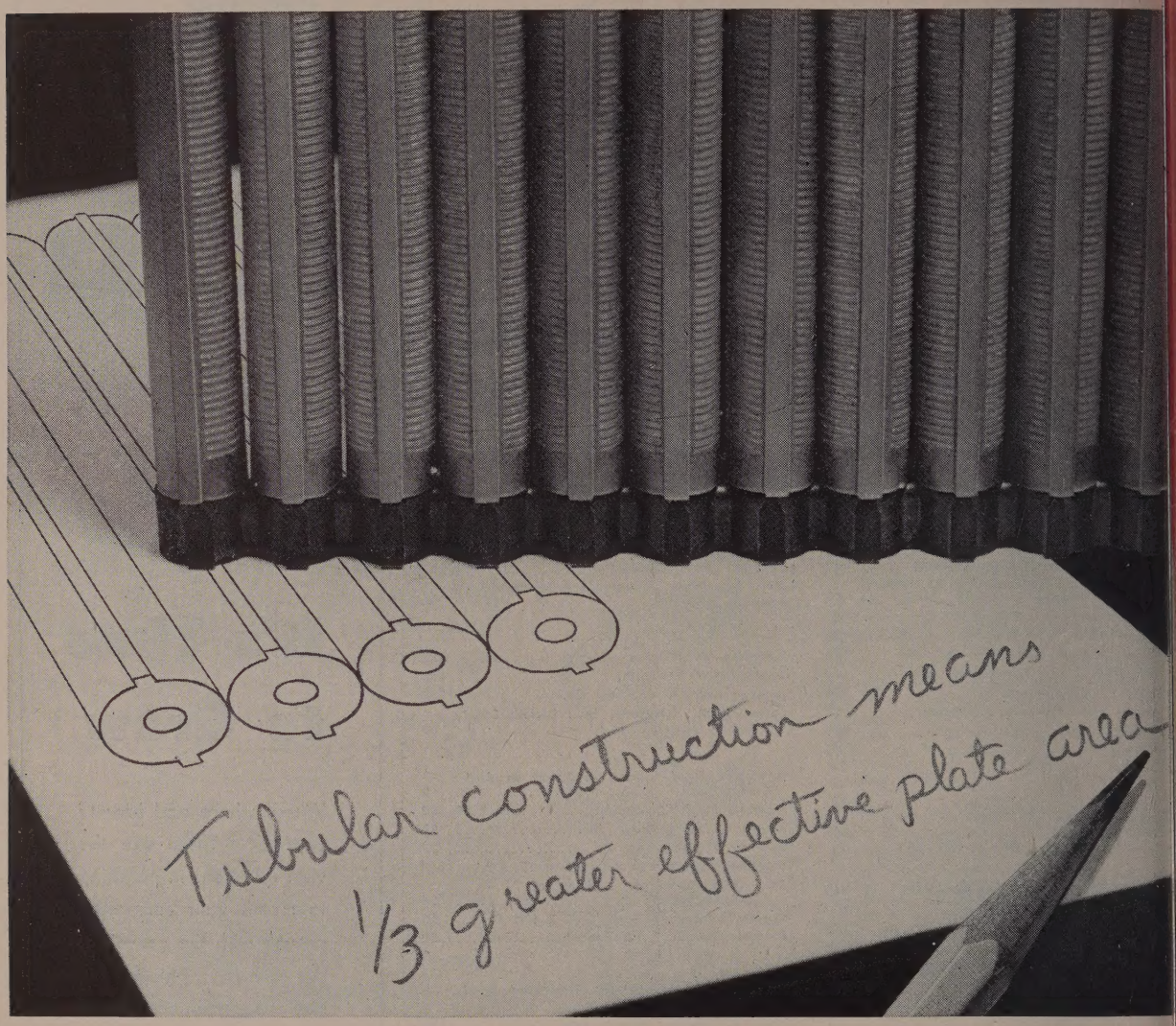
IN

STEEL

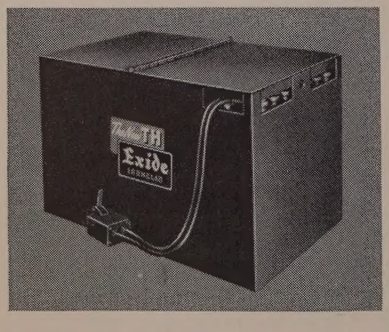
It's Time to Grow

When, where and how to expand? These are the vital questions in planning to match your company's growth with the growth of the economy. Starting too late may mean the loss of your full share of tomorrow's bigger markets. Building too much, too little or too fast can be equally costly. Shifts in markets, in labor supplies and in raw materials sources will be other major problems. STEEL's guide lines for growth will show you how to gage your potential and how best to make the most of it.

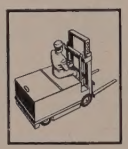
EXIDE-IRONCLAD BATTERIES



Greater effective plate area boosts power for peak loads



BATTERY FOR POWERED HAND TRUCK, Model TH. Fits snugly into space provided on truck. Has tubular construction of positive plates, Silvium grids, "Permanized" negative plates, extra heavy connectors and all other Exide-Ironclad advantages that mean power to spare in heavy duty applications. Write for Bulletin 5161.



According to general principles of storage battery engineering, power reserve is governed by positive plate area. In the Exide-Ironclad greater effective plate area is achieved without increasing plate size. Here's how:

In the Exide-Ironclad positive plate, active material is held captive in tubes of slotted polyethylene. These tubes are arranged in a tight row with electrical connections only at the top. The actual surface of the plate is the combined semicircular sides of these tubes—the total surface area being roughly one-third more than the projected dimensions of the plate.

In use, this unique design feature means that more active material is exposed to electrolyte for a given size battery. It means the battery can provide power to spare for peak loads as well as a dependable source of continuous power.

Only Exide-Ironclad Batteries have this advantage. Be sure to specify them when you order—for either new equipment or for replacement. Exide Industrial Division, The Electric Storage Battery Company, Phila. 2, Pa.

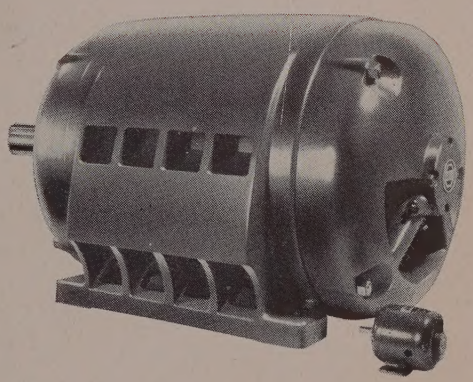
Exide®

You Name It—Thousands of Ratings

From 1/8 to 400 H. P.

See MASTER for a selection of motor drives that you can get nowhere else—for specialized power drives unequalled for flexibility, compactness and performance. See Master for the right horsepower, right shaft speed, right mounting features—to add salability to your products, efficiency to your plant equipment.

Master components are designed to combine in one compact unit to suit your needs exactly—all the way up to 400 H. P. Just ask us for information.



Motor Ratings..⅛ to 400 H.P. All phases, voltages, and frequencies.

Motor Types.....Squirrel cage, slip ring, synchronous, repulsion-start induction, capacitor, direct current.

Construction ....Open, enclosed, splash-proof, fan-cooled, explosion-proof, special purpose.

Speeds .....Single-speed, multi-speed, and variable speed.

Installation .....Horizontal or vertical, with or without flanges and other features.

Power Drive Features .....Electric brakes (2 types)—5 types of gear reduction up to 432 to 1 ratio. Mechanical and electronic variable speed units—fluid drives—every type of mounting.

THE MASTER ELECTRIC COMPANY
Dayton 1, Ohio

MASTER ELECTRIC MOTORS

How TIMKEN® bearings maintain spindle precision, accurate gear mesh on extra heavy-duty lathe

AT the flick of a lever, the operator of this Warner & Swasey 1-A *extra heavy-duty* lathe can get any one of 16 spindle speeds immediately. Then, with the right speed for the job, this lathe can hog off a lot of metal fast—and still turn out close-tolerance parts.

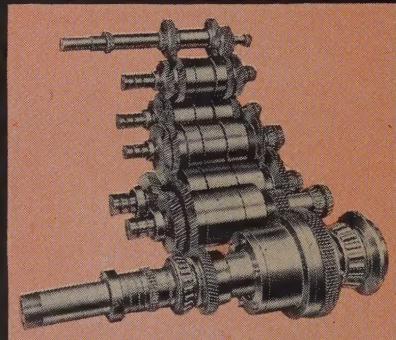
To help assure both precision and ruggedness, at any speed, Warner & Swasey engineers have mounted the spindle and gear train on Timken® tapered roller bearings. Timken bearings maintain spindle precision and accurate gear mesh day in and day out, piece after piece. They're tapered to take both radial and thrust loads, in any combination. Full line contact between rollers and races provides maximum capacity. Shafts are held in alignment. Gear mesh is smoother, more accurate. Shaft wear is eliminated, gear wear reduced.

True rolling motion, plus almost microscopically smooth surfaces combine to make Timken bearings practically friction-free. They're made from Timken fine alloy steel—steel that's nickel-rich for extra toughness. We're the only bearing manufacturer in America that makes its own steel. Rollers and races of Timken bearings are case-hardened for hard, wear resistant surfaces and tough, shock resistant cores.

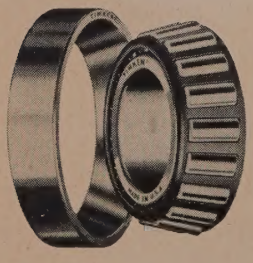
No other bearings can offer yo all the advantages of Timken bear ings. That's why so many manufac turers of fine equipment use them Whether you build or buy machinery be sure to specify Timken bearings And look for the trade-mark "Timken stamped on every bearing. The Timke Roller Bearing Company, Canton 6 Ohio. Canadian plant: St. Thomas Ontario. Cable address: "TIMROSCO"

TIMKEN BEARING EQUIPPED

This symbol on a product mean its bearings are the best.



Here's how **THE WARNER & SWASEY CO.** uses Timken bearings in the power train and spindle of its 1-A *extra heavy-duty* lathe to insure ruggedness and precision.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

REVOLUTIONARY BUCYRUS PLANT HELPS HOLD DOWN RISING COSTS

At a new plant in Bucyrus, Ohio, the Timken Company has substantially reduced the cost of tapered roller bearings by: 1) producing these bearings under a new system of extreme mechanization; 2) standardizing on 13 bearing sizes with the widest applications throughout industry. Manufacturers can take advantage of these lower costs by redesigning applications to use these Bucyrus sizes. And as more switch to Bucyrus bearings, production costs can drop still further, meaning even lower costs to you.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ⇩ AND THRUST →⇩← LOADS OR ANY COMBINATION →